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A QUESTIONING STRATEGY AS AN AID IN DEVELOPING  
THE THINKING OF LOW READING COMPREHENDERS

by



ELEANOR LOUISE HISCOCK MUISE

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH  
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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A Questioning Strategy as an Aid in Developing the Thinking of Low Reading Comprehenders submitted by Eleanor Louise Hiscock Muise in partial fulfilment of the requirements for the degree of Master of Education.





## ABSTRACT

The purpose of this study was to investigate in an exploratory manner the effectiveness of a questioning strategy in developing the thinking of low reading comprehenders in response to questions of analysis, application, synthesis and evaluation. For this purpose a questioning strategy was designed by the researcher using the work of Taba (1967) and Hunkins (1972). This strategy was then implemented in conducting twenty story-discussion sessions with a small group of eight fifth graders over a one month period. A control group of eight pupils received instruction from the researcher in specific language-arts skills during this time. All sessions conducted with both groups were tape recorded but only those of the experimental group were transcribed. Five selected discussion transcriptions were later analysed to provide a measure of progress from lesson to lesson throughout the sessions. A measure of performance before and after the treatment was obtained by administering comparable pre and post tests designed by the researcher. Questions of these tests were designed in a similar manner to the basic key questions of the discussion sessions. Each test related to a different though comparable story taken from elementary reading materials and was administered orally and individually to each pupil. Tape recordings were made of each pupil's response for later transcription and analysis.

All pupils participating in the study were identified as low reading comprehenders of average or above intelligence who spoke English as a first language. They possessed word identification skills within their fifth-grade level and adequate language facility.





No pupil experiencing severe emotional problems or learning disability was included in the study.

All questions and responses of the pre and post tests were classified according to the Ohio Scales I and II. Responses were further studied for the degree of complexity they demonstrated and their appropriateness to the questions asked. All questions and responses of the five selected discussion transcripts were subjected to similar analysis. These data were then descriptively analysed.

Findings of the analyses revealed that the experimental group made greater progress than the control group in developing thinking to higher levels on the posttest than the pretest. They also gave a greater number of supported responses. A high frequency of unsupported responses and responses not appropriate to the question occurred within both groups, however. Furthermore the evaluation questions generally did not elicit evaluative responses. In discussion, pupils participated more frequently than the teacher though generally in response to the teacher's questions. Their questioning activity occurred rarely and demonstrated questions of a low caliber.

These results led to the conclusion that the questioning strategy was effective in a general way in developing pupils' thinking related to higher-level questions. It was less effective however, when specific kinds of questions, particularly the evaluation questions, were considered. It appeared that specific instructional techniques in comprehending specific kinds of questions and instruction in how to answer them was a need of the students who participated in this study.



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## CHAPTER I

### OVERVIEW OF THE STUDY

#### INTRODUCTION AND STATEMENT OF THE PROBLEM

Comprehension is the very heart of the reading act. There is no use reading unless one understands the meaning. (Smith, 1969, p. 251)

The above statement by Nila Banton Smith (1969) reflects one of the major objectives of reading and reading instruction. In order for comprehension to have taken place, there must be the acquisition of meaning. The meaning a pupil derives from the printed page, however, involves a complex process that results in varying degrees of understanding. This understanding may vary from knowing the literal content of what the author has written to reasoning and thinking beyond the literal level. Whatever level of understanding results, it is evident that a thinking process has been involved.

The development of thinking processes or of the cognitive potential of pupils is a major issue of reading comprehension. Thus, focus of concern indicates that comprehension is more than being able to repeat verbatim what has been read, or being able to recall factual information. The real criterion of understanding is the ability of the pupil to utilize the knowledge he has obtained from reading in a form of productive thinking that requires him to comprehend how specific facts are interrelated, to apply knowledge to new situations, and to analyse, synthesize and evaluate what he has read. This represents what is commonly called the higher levels of thinking.



Basic to this productive thought is the acquisition of factual information. Such acquisition of knowledge therefore becomes a means to an end rather than an end in itself.

There is evidence in research that many children do not comprehend beyond the first or initial level of obtaining factual information and require help in becoming productive thinkers (Taba et al., 1964; Betts, 1961; Stauffer, 1960). Betts (1961) contends that research findings give evidence that children who have not learned to think far outnumber those who have not learned necessary phonic skills. If we consider the learning of phonic skills as the mechanics of pronouncing words in print, then we must consider the situation which Betts presents as indicating that a large proportion of 'readers' exist who more aptly might be called 'word callers.' Their problem lies, not in pronouncing words, but in being able to extend their thinking beyond the literal message which these words present. If these pupils are to become productive thinkers, then it is necessary that a plan be devised whereby such pupils are guided into thinking about the knowledge they have obtained from the print (Betts, 1961).

In order for teachers to assist pupils in gaining competency in thinking and understanding beyond this literal level of print, they must first establish definite assumptions about the thinking process. These assumptions can then direct the specific procedure they choose in assisting pupils. Bloom (1956) states that the thinking process is a sequential process which involves a variety of skills ranging from the lowest level of knowledge and translation to the higher levels of application, analysis, synthesis and evaluation.



This belief is supported by Wheatley (1975), Hunkins (1972), Wolf et al. (1967) and Sanders (1966). In addition to being sequential in nature the thinking process is able to be learned. That is, it can be taught within the limits of identifiable skills (Wolf et al., 1967; Taba, 1966). Furthermore, thinking is an interactive process. The reader must interact with the message or material before him (Taba, 1966). Competency in this interactive process however, requires an adequate knowledge base from which the pupil can extend his experiences and engage in what writers frequently call a communicative process with the author (Barrett, 1974; Gantt, 1970). Once this knowledge base has been established, however, the pupil engages in a contemplative thinking process that allows him to reflect, judge, analyse, synthesize or apply the material he has read. Thus he extends his thinking beyond the knowledge base and engages in productive thought.

If the thinking process is sequential, interactive and able to be learned, a plan for directing pupils' thinking must incorporate these beliefs. Questioning has long been recognized as a method of directing pupils' thinking (Austin, 1949; Stevens, 1912). Taba (1964) claims that questioning is crucial to the process of developing thought, and Weintraub (1969) identifies questioning as the most commonly used technique for guiding reading behavior. In fact, reading teachers devote a very large portion of their time to asking questions. The problems identified by researchers in teachers' use of questions, however, is that generally they ask factual and inference questions of a closed type and tightly structured so that pupils' thinking is not directed beyond the factual or interpretative levels (Mueller,





1972; Gall, 1970; Guszak, 1967). Furthermore, a discrepancy exists in the type of questions teachers ask various reading groups. This discrepancy is also found in questions posed in text-type materials designed for various reading levels. While memory type questions tend to be more frequently used at all reading levels than any other type question, it is most frequently used with below average readers than with any other group (Mueller, 1972). Few questions that can be rated in the higher-level thinking categories of divergent thinking are asked these pupils. Thus, it would appear that this group of pupils is not expected to be able to think within the higher levels of the thinking process. The opportunity to lead them into higher levels of thinking through analysis, application, synthesis or evaluation is consequently being missed.

The question being asked by this study then becomes that of: Can a specially designed strategy of questioning implemented by a teacher in directing lesson discussions assist a 'below average reader' who is of average or above intelligence, and reading words at his grade level, in thinking within these higher levels of productive thought, i.e. within the analysis, application, synthesis and evaluation levels? The "below average reader" for this study is interpreted as a "low reading comprehender."

#### PURPOSE OF THE STUDY

The major purpose of this study was to investigate and describe the effectiveness of a questioning strategy designed by the researcher as an aid in developing the thinking of fifth grade, low reading



comprehenders in responding to questions of analysis, application, synthesis and evaluation. The questioning strategy was specifically for the purpose of directing small group discussions of selected stories. It was not used as a teaching technique whereby pupils were taught how to respond to the various kinds of questions, but was a technique of questioning used by the researcher only in directing pupil discussions.

#### DEFINITIONS OF TERMS

For the purpose of this study the following definitions were used:

##### Low Reading Comprehender

A pupil with a reading comprehension score of one year or greater below his present grade level according to the Van Wageningen Analytical Reading Scales and a comprehension rating of less than 75 percent on four of the five reading phases tested by this particular test. In addition he scores within two months of his present grade level in word accuracy according to the Schonell Graded Word Reading Test.

##### Generalization Strategy

A sequence of generalizations designed from a particular story, each level of which represents a progressively higher level of abstraction from the initial generalization.

##### Questioning Strategy

A scheme or plan of questioning which consists of (1) a





carefully planned set of questions designed from the generalization strategy which are arranged within a sequence of thinking levels ranging from the factual level to the evaluation level of the modified Ohio Scales, part one, for classifying teachers' questions and statements hereafter referred to as the Ohio Scales I (Chapter III, p. 94 ). Within the sequence a question either focuses, extends, raises or lowers thinking at any one level of the scale or changes the focus of thinking to a new topic; (2) a number of on-the-spot questions which are unplanned and raised during discussion in response to an answer or statement given by a pupil; and (3) a number of procedural techniques thought necessary for conducting an effective questioning-discussion. These include (a) redirecting a question to various pupils within the group, (b) allowing a lapse time of approximately 3 to 5 seconds prior to expecting responses after a question has been raised, and (c) avoiding interlocking behaviors such as repeating questions and pupil responses unnecessarily and the answering of questions by the teacher after a brief interval of silence.

## Questions

### (1) Key Questions

Any question within the set of prepared questions that was designed from the generalization strategy is a key question. On-the-spot questions were not considered key questions.

### (2) Functional Questions

Functional questions attempted to expand, lower, raise or clarify the pupil's thinking from that demonstrated by him in a



previous response. Such questions were asked in order to develop a more appropriate response than that given by the pupil. They were not key questions because they occurred on-the-spot.

Note: Other questions than key questions and functional questions occurred within the verbal interaction of the lesson discussions. These sometimes introduced a new topic for discussion not planned for previously, refocused pupils' attention when the discussion was diverted or asked a pupil to explain what he meant by his response. Such questions were not prominent in the study and mention of them is made for clarity purposes only.

### (3) Higher-Level Questions

Any question that is classified as analysis, application, synthesis or evaluation according to the Ohio Scales I. Each of these questions would also be a functional, key or "other" question. For example, an analysis question could be an analysis key, analysis functional or analysis "other."

### Assisted Responses

Responses given by pupils to the teacher's functional questions.

### Unassisted Responses

Pupils' responses that occur immediately following the posing of a question that is not a functional question.



### Questioning Discussion

A small group discussion of a selected story that is directed and controlled by the specific questioning strategy used in this study.

### Higher-Level Thinking

Thinking as indicated by a response that can be classified within Levels 3, 4 and 5 of the modified Ohio Scales, part two, for classifying pupil responses hereafter referred to as the Ohio Scales II (Chapter III, p. 96 ).

### Average Intelligence

An intelligence quotient score, hereafter referred to as I.Q., that falls within the range of 92-108 on the Canadian Lorge-Thorndyke Intelligence Tests, Level C, Form I, Nonverbal and Verbal Batteries.

### Readability

The relative difficulty of a story selection as measured by the Dale-Chall Formula for Predicting Readability.

## THE RESEARCH QUESTIONS

The following questions provided direction and purpose to the study. It is important to note that the first of these questions relates to the performance of the experimental and the control groups. It is posed as a means of assessing the overall effectiveness of the questioning strategy in terms of the pretest and posttest performance of both groups. Questions 2 and 3 however, relate to the performance of the experimental group only as pupils in that group progressed





from lesson to lesson and were designed to assess the effectiveness of the questioning strategy within the discussion sessions.

1. Can pupils classified by this study as low reading comprehenders be assisted through the use of a questioning strategy in developing thinking related to questions of analysis, synthesis and evaluation?\* That is, will there be an observable difference in pupil performance on a posttest from a pretest in terms of:

(a) The instances of progression from a lower level of thinking to a higher level of thinking on paired questions of the pre and post tests by pupils of the experimental group as compared with those made by pupils of the control group for all analysis, synthesis and evaluation questions asked?

(b) The instances of pupils progressing from a lower degree of complexity to a higher degree of complexity when their responses to paired questions of the pre and post tests remain within the same level by pupils of the experimental group as compared with those made by pupils of the control group for all analysis, synthesis and evaluation questions?

(c) The frequency of pupil responses at Levels 3, 4 and 5 of the Ohio Scales II for the analysis, synthesis and evaluation questions asked?

2. When considering the verbal interactions of selected small group discussions of stories directed by a questioning strategy:

(a) Is there a higher frequency of teacher questions and

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\*Deletion of the application question is explained in Chapter IV, page 134.



statements to pupil responses?

(b) Is there a greater percentage of pupil responses to other pupils' statements or questions than pupil responses to the teacher's questions and statements?

(c) Do pupils themselves initiate questions? If so, what proportion of their total verbalizations involves questioning and what kinds of questions do they ask?

3. What changes occurred in pupil responses over a one month period? That is, as pupils of the experimental group progressed from one selected lesson to another were there observable increases in:

(a) The frequency of pupils' responses at Levels 3, 4 and 5 of the Ohio Scales II to analysis, application, synthesis and evaluation of questions.\*

(b) The frequency of unassisted Level 3, 4 and 5 responses that occurred immediately following the posing of a higher-level question that did not require lowering, expanding or raising techniques on the part of the teacher?

(c) The frequency of questions raised by pupils?

(d) The frequency of pupils responding to other pupils in either a question or statement?

#### ORGANIZATION OF THE STUDY

This study was conducted in three parts. The first involved the selection and evaluation of reading materials suitable for grade

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\*The inclusion of application questions is explained in Chapter IV, page 134.



five pupils from a number of basal readers and language arts reading series. In a second part of the study a generalization strategy for each story selected, and a set of questions formulated from the generalization strategy, were designed by the researcher and evaluated by independent judges. The final part involved the conducting of twenty daily discussions with an experimental group using the story selections and the specific questioning strategy designed for the study. These discussions extended over a one month period and were taped for later transcription and analysis. During this time a control group was instructed in integrated language arts skills. A pre and post test, constructed for this study, was administered individually and orally to all pupils in both the control and the experimental groups before and after the treatment period. The entire test session for each pupil was taped and later transcribed.

The population for this investigation consisted of sixteen grade five pupils from one Edmonton school. These pupils were selected from five classes of 150 fifth graders and were assigned to a control group and an experimental group using a stratified randomization. Pupils within each of these groups were selected on the basis of intelligence, word recognition skills, reading comprehension and language facility. The groups were considered comparable in these respects.

Although controls were implemented in the study design, the study itself was exploratory and descriptive in nature. The data were not subjected to rigid statistical analysis but were descriptively analysed in terms of (1) pre and post test performances and (2) lesson-





by-lesson progressions.

All questions asked and all pupil responses from transcribed tapes of the pre and post tests were classified according to the Ohio Scales I & II, a two dimensional construct. Questions were classified by kind according to part one of these scales for classifying teacher's questions and statements and the classifications assigned by the researcher judged by two professors experienced in the field of questioning. Responses meanwhile were classified by levels according to part two of the scales for classifying pupils' responses. These responses were further categorized according to their complexity and appropriateness using scales devised by the researcher for these purposes (Chapter IV). Improvement in performance from the pretest to the posttest was calculated for pupils of both the experimental group and the control group and a series of comparisons made between the pre and post test performances within each group and between both groups. Analysis was also made of how the analysis, synthesis and evaluation questions of the pre and post tests were generally answered by pupils, and between test comparisons of pupil performance made.

The teacher and pupil verbalizations of five selected lesson transcriptions of the twenty daily lessons conducted were subjected to similar classification as the pre and post tests using the Ohio Scales I & II and the systems devised for assessing the complexity and appropriateness of pupil responses. In addition, functional techniques employed by the teacher in lowering, raising and expanding pupils' responses were identified. The frequency of Level 3, 4 and



5 responses to all higher-level questions of analysis, application, synthesis and evaluation were identified within each of the five selected lessons and a lesson-by-lesson comparison conducted in order to detect change over time in pupils' responses. Because of the limited number of responses occurring for each higher-level question asked, responses were not studied in terms of each question kind as in the pre and post tests, however. Responses were studied in a more global manner as they related to grouped higher-level questions.

In order to assess the effectiveness of the questioning strategy used within the study in terms of pupil and teacher interaction, further comparisons were made of the frequency of teacher and pupil verbalizations, pupil initiated questions, and pupils' responses to their peers as opposed to those made in response to the teacher. Pupils' questions were further analysed to determine the kinds of questions they asked. Results of these analyses are presented in descriptive and tabulated forms.

#### ASSUMPTIONS

The following assumptions underly this study:

1. That the information taken from the school files and provided by teachers was accurate, and that all sixteen pupils who participated in the study were correctly diagnosed as low reading comprehenders according to the limitations set by the study.
2. That the experimental and control groups were comparable.
3. That thinking is a sequential process that can be developed through questioning.



4. That the responses of pupils were accurately classified within the Ohio Scales II and that the levels at which pupils' responses were categorized reflected the levels at which they were thinking.

#### LIMITATIONS OF THE STUDY

Conducting a small-group discussion demands on-the-spot decisions, diagnosis and formulation of questions. It means asking the right question at the right time in terms of attending to the content of what the pupil says as well as his thought processes. The efficiency of the researcher in making such decisions and diagnosis, and in formulating appropriate questions is a definite limitation of the study.

The questioning strategy of this study was devised by the researcher from the available literature. It represents only one possible manner in which a strategy could have been planned. Furthermore, the generalization strategy for each story, which served as a framework from which to ask questions, represents the researcher's thinking as to what might be a worthwhile focus for discussion within each story. Other researchers might have selected a different emphasis upon which to focus questions. Therefore the findings are limited to the particular generalization strategy and questioning strategy used within the study.

The study took place over a one month period including a total of 20 consecutive school day sessions. This may not have been sufficient time to assess the effective use of the questioning





strategy. Findings must therefore be viewed in light of this factor.

Because the reading-discussion sessions were conducted by the investigator over a period of one calendar month and involved pupils from five classrooms, periods were scheduled for fixed times for each group during each day to avoid considerable disruption to classes. This did not provide for randomization of physical or psychological effects upon the pupils. Furthermore, no attempt was made to account for individual differences in motivation, interest or personality of these subjects beyond the random assignment of pupils to the treatment and control groups.

This study was limited to a small group of 16 subjects from one school environment. The results cannot be generalized beyond this group.

Finally, the conclusions made in this study must be viewed in relationship to the degree to which verbal expression can be judged as a measure of thinking processes. Some pupils within the group were more verbal than others and obviously had a greater command of language than certain of their peers. Although control of language facility was attempted within this study it is recognized that certain children's understanding of situations may have exceeded their ability to express it.

#### SIGNIFICANCE OF THE STUDY

Much has been written about the use of questions as a technique for developing thinking, and the application of questions in reading situations (Gall, 1970; Stauffer, 1969; Wellington and



Wellington, 1969; Smith, 1961; Austin, 1949; Stevens, 1912). In terms of reading research however, the main emphasis has centered around the cognitive dimension of classroom questions and textbook questions. Only a few studies have attempted to establish a relationship between the effects of questioning levels upon students' reading responses and achievement (Ryan, 1973; Davidson, 1970; Petre, 1969; Hunkins, 1966). This researcher, however, found it difficult to locate studies which explored a possible relationship between the actual use of questioning strategies and the development of pupils' thinking. This area of research is relatively uninvestigated and is in need of future study. The need for such a study was suggested by Hunkins (1966) as a result of his own research.

The findings of this research will possibly reveal pertinent information on the nature of questioning as a means of stimulating and expanding the thought processes of low comprehending readers. It may prove to be illustrative of how questioning strategies can be utilized in developing critical thinking processes in such readers. Should this be the case, the study would be considered of a practical value for the future teaching of low reading comprehenders. Furthermore, it may indicate the need for change in the present questioning practices both by classroom teachers and by authors of textbooks. The essential change would involve a refocusing of questioning to develop thought processes in low comprehending readers that extend beyond the level of simple recall of factual information.

The study may also have implications for professors of teacher education. The results may suggest a need for more constructive work



in the area of teacher education, particularly in the use of questioning as an effective strategy in developing comprehension skills.

Finally, the results of this study may prove to be useful in supplementing existing literature concerned with the use of questioning strategies in developing reading comprehension, and the ideas and sample lessons presented may assist teachers in devising teaching strategies.

#### ORGANIZATION OF THE REPORT

The research investigation is reported according to the following plan.

Chapter II presents the research literature that provided the background for the study.

Chapter III describes the experimental design of the study and Chapter IV explains the construction of the generalization and questioning strategies, and the main test instrument used in the study.

Chapter V contains the analysis of the data and the results.

The final chapter, Chapter VI, presents the main findings, conclusions and implications of the study.





## CHAPTER II

### REVIEW OF THE LITERATURE

The issue of the effectiveness and productivity of teachers' questioning behavior has been the focus of much attention for almost half a century (Stevens, 1912). Over the past decade or so, greater emphasis has been placed on the actual use of questions in a teaching strategy (Davison, 1970; Hunkins, 1966, 1972; Taba, 1964, 1965, 1966). It has been postulated by Hunkins (1972) that questions may be specifically arranged in a questioning sequence or strategy, for the purpose of guiding and directing pupils' thinking from a low cognitive level of recall through the higher cognitive levels of analytical and evaluative thinking. The actual implementation of such a questioning strategy in research, however, cannot be found in a survey of research literature. Evidence that children's thinking, particularly that of slow learners, can be improved through the careful use of questions is found in Taba's investigation of teaching strategies (Taba, 1964). She concludes that it seems "how people think may depend largely on the kinds of thinking experiences they have had" (p. 25). An integral part of these 'thinking experiences' is thinking elicited by teachers' questions.

Since this present study is concerned with the use of questioning strategies in developing pupils' thinking processes during reading discussions, this chapter will provide a report of pertinent research and literature in (1) the development of children's



thinking, (2) the relation of reading comprehension to thinking, (3) Bloom's Taxonomy as a basis for developing questioning systems and questioning systems relevant to this study, (4) questioning practices within teaching, (5) the effects of questioning on pupils' thinking performance and (6) the art of good questioning. Of necessity, the reviews presented in these six areas will be selective and brief since space does not permit elaborate or lengthy discussion of the many and varied viewpoints found in the literature. No attempt will be made to review the literature related to interaction analysis. While a minor part of this present study related to pupil-teacher participation, the main focus of the study was not considered to involve the analysis of group interactions and therefore did not necessitate reviewing the research literature.

#### THE DEVELOPMENT OF CHILDREN'S THINKING

This section presents the views of four researchers of children's thinking, Piaget (1963), Peel (1960), Taba et al. (1964) and Russell (1956). Common elements from their work will be identified and these applied to the present study.

Thinking, according to Russell (1956) is one of the many fairly clear and familiar things that is extremely difficult to define. Consequently, the word has become an 'omnibus term' carrying a variety of ideas about kinds of thinking and thinking processes. Since thinking is a covert activity which a child engages in, its development can be studied only from observation of overt activities, or from an analysis of verbalizations made during these



activities. Peel (1960) points out that through such observation and analysis one can attempt to define thinking in terms of logical operations that are performed, or attempt to explain the performance in terms of psychological processes. The Swiss psychologist, Jean Piaget, takes the 'psychological processes' approach in explaining the development of children's thinking. This renowned psychologist, together with his associates at Geneva, has been studying the nature of children's thinking and learning for over fifty years. These studies have revealed a developmental sequence or series of stages in the growth of thought (Piaget, 1963; Inhelder, 1962).

It is the final stage of growth identified by Piaget that is most relevant to this study of ten and eleven year old fifth graders. This final stage is the stage of formal thought. According to Piaget this stage is evident from age eleven onwards and is marked by the fact that "the subject can reason on the basis of abstract hypothesis" (Piaget as quoted by Elkind, 1971, p. 9). Objects and actual manipulation of them in order to conceptualize as in the preceding concrete operational stage are no longer necessary. The child of eleven years and onward can now engage in propositional thinking that will allow him to think through simple or more complex problems, at the same time selecting the most appropriate or logical procedure for doing so. In terms of this present study cognitive tasks of judging using a criteria for evaluating, analysing situations, applying present knowledge to new or unfamiliar settings and situations, and synthesizing a number of related parts into a whole such as in the giving of an explanation, or a story were interpreted as





some of the cognitive tasks therefore assumed within the formal stage of thinking. A salient feature of Piaget's stages of development however, is the development of complexity within each stage. It can therefore be expected that the eleven year old will not be capable of establishing the same relationships between experiences and actions as the fourteen year old, for example. Similarly, his manipulation of language and symbols that represent ideas will not be as advanced as the teenagers. Since there is therefore a progression from simple to complex within each stage, the formal stage of thinking can be expected to represent degrees of differences within the kinds of thought that are observed. It can be assumed then that the fifth grade, eleven year old, as in this study, will be able to evaluate situations, apply information, analyse wholes into component parts and synthesize. Furthermore, it might be assumed that the level at which he engages in these cognitive operations will be of a simple nature in view of the fact that he has only entered the formal stage of thinking. But what of the ten year old fifth grade pupil who is nearing age eleven? Is it to be assumed that he has not entered the stage of formal thought and therefore cannot engage in any of these cognitive tasks? The developmental nature of Piaget's theory provides a partial answer to this question. Essentially growth is a maturational process, according to Piaget, that is hierarchical in its organization. Each stage is necessary and a prerequisite for the following stage. The mental structures developed at each level influence the success of the subsequent level, and the increasingly more complex structures developed at each level, provide new competencies for abstract and



complex thinking (Taba et al., 1964). According to Piaget, however, "all manner of variables may affect the chronological age at which a given stage of functioning is dominant in a given child: intelligence, previous experience, the culture in which the child lives, etc." (Flavell, 1963, p. 20). However, Flavell emphasizes that his own findings with respect to age and stages, indicate that they are not to be taken overliterally, and that these findings provide an estimate of the mean ages at which the various stages are achieved. Peel (1960, p. 173) concurs with these views and further asserts that there is nothing in Piaget's theory that suggests the onset of new levels cannot be accelerated by the right kinds of experiences. If this is the case, the ten year old might well be expected to be able to perform within these levels. Peel's assertion however gives rise to two further questions which are significant to this current study: Is it possible to find within a group of ten and eleven year old fifth graders, pupils at age ten whose thinking equals or surpasses that of the eleven year old because of previous acceleration? And, can the posing of appropriate questions in a sequence accelerate pupils' cognitive performance? Furthermore, it becomes evident that discrepancies in both the level at which individual pupils will perform and the complexity of their thinking is to be expected as well as a possible indication that certain pupils cannot engage in certain cognitive tasks because prerequisite mental structures have not been developed. Therefore, those pupils of this study who have not yet reached age eleven must not be assumed incapable of engaging in formal thought nor should those having reached age eleven be



assumed capable of doing so.

Basic to Piaget's theory is a dynamic and continual mental reorganization process known as assimilation and accommodation. Each child operates (i.e. thinks) within an existing cognitive structure known as a 'schema.' All new information he receives from the outside world must be fitted into the patterns of concepts and relationships that already exist in his mind in order for them to have meaning. This will involve a process of reorganizing concepts and relationships when the information is different from that which is already established. In other words, he must accommodate this new information. If it cannot be fitted into his present schema a state of inequilibrium results, that is, an imbalanced relationship. He must therefore accommodate the demands of his environment "so he can be restored to a state of equilibration or balance" (Sylwester, 1969, p. 59). This feature is particularly significant when considering the role of questioning in this present study. If experiences are totally absent from a pupil's background it seems therefore accurate to postulate that he will not only respond to questions inappropriately or incorrectly, but continued questioning might result in further frustration because of a lack of even related experiences. On the other hand, one might hypothesize that where related experiences are within the pupil's background, the process of assimilation and accommodation might be assisted through the refocusing of questions upon these related experiences. However, the degree to which he can assimilate will depend upon the similarities of the experiences. Responses will therefore vary in their complexity as a consequence of





this feature, rather than as a consequence of his ability to think within particular levels.

Whether formal thought is limited to the adolescent stage as asserted by Piaget, has been a point of controversy among writers and theorists, however. Wheeler (1958) holds rather opposing views to those of Piaget and asserts that there exists within the capacity of the average seven year old, most of the elementary schema necessary for valid thinking. All subsequent development after this age is chiefly that of acquiring more experience in the use of the capacities, resulting in an increase in the complexity of the problems he is able to solve. Furthermore, he concludes, the capacity is trainable and able to be accelerated by training. Peel (1960) and Ervin (1960) also view positively the role of training in accelerating the growth of thinking which is an underlying assumption of this current study.

A deliberate attempt was made by Taba et al. (1964) to examine the effect of training on the development of children's thinking. A number of Piaget's ideas and concepts were integrated into the study. Of particular importance was his idea of the construction of a conceptual schema, his concept of assimilation and accommodation, and his concept of thinking as a sequential and hierarchical developmental process. Using a social studies curriculum in which these concepts were embedded, Taba set about first to translate the requirements of thought according to these concepts into teaching strategies, and then to examine the effects of these strategies on pupils' thinking. Three cognitive tasks, representative of levels of thought, were designed for the study, and sequential



steps within each task, developed. The tasks consisted of grouping and classifying, interpreting data and making inferences, and applying previous knowledge, principles, generalizations or facts to explain new phenomena and predict consequences. Twenty teachers in classes of grades two through six, specifically trained for the project, directed these tasks over a one year period.

A measure of progress or growth in pupils' thinking was obtained from administering The Social Studies Inference Test as a pre and post test. Although an Application of Principles Test had been designed for the study together with the inference test, it could be used only for exploratory purposes since it could not be statistically established with any degree of reliability.

In considering the findings of this study however, it is important to view them in terms of what this researcher considers limitations within the study design. One might question whether The Social Studies Inference Test provided an accurate measure of the treatment administered. Whereas the treatment consisted of guided discussions of various social problems, the test, a multiple choice design, required pupils to answer an inference statement as either 'true,' 'false,' or 'can't tell from the data that is given.' It is always difficult to know in a pencil-paper test of this kind exactly what the product, i.e. the selected answer, reveals in terms of thinking processes. Furthermore, it is questionable as to whether presenting an inference statement for evaluation elicited the same cognitive processes as confronting the student with a social situation for him to consider, discuss and formulate inferences about. Since



the inferences were given him it seems highly unlikely that the test measured the pupil's ability to make inferences. The situation of having pupils respond orally to open ended questions, as in this present investigation, appears to this researcher to be a more accurate means of assessing the effectiveness of the treatment as well as assessing growth in the pupil's facility with particular kinds of thought processes. A further point of concern within this study is the teachers' reading each paragraph and item of the test orally to the pupils while the pupils were asked to "follow along" in their booklets. One might question to what extent this oral reading to the pupils was a distractive element in their concentration or thinking, and to what extent they actively participated in providing a response. These factors of the test design are cited, not as being detrimental to the study, but as limitations that must necessarily be considered in interpreting the findings. The same limitation is to some degree recognized within the present study, however. Although pupils read the story selections for the pre and post tests silently, thus removing the distractive element noted in Taba's research, the questions of the pre and post tests were of necessity administered orally by the researcher while each pupil listened.

Analysis of data from the Taba et al. study revealed that considerable growth in transformations of concrete thought into formal thought is evident from the second through the sixth grade, with formal thought beginning 'in a small way' in the second grade. "Its frequency increases slowly until in the fifth and sixth grades it represents approximately one sixth of all thought units." (p. 173). This





indicates an earlier beginning of formal thinking than had been suggested by Piaget and supports Peel's (1960) views of acceleration discussed previously. They also lend positive support to the question raised by this researcher of whether or not ten year old fifth graders, as in this study, might perform equally as well or better than their peers who were slightly older.

Support was also found in the Taba et al. study for the hypothesis that slower learners would be capable of abstract thinking under a program which paced assimilation according to their needs, and provided sufficient opportunity for concrete operations prior to making a transition to abstract operations and symbolic content. Slow learners were generally low participators however. Taba et al. conclude "these findings seem to confirm the theoretical point that intellectual functioning develops with activity and therefore, the child deprived of this opportunity may actually fail to develop higher levels of thought" (p. 163). Without sufficient time for the assimilation phase to take place, the accommodation phase might never occur. This latter finding appears to stress two important features in the development of pupils' thinking related to the present study: (1) the need for pupils to be given opportunities to think at all levels of thought while at the same time considering the limitations of the skill in younger as opposed to more advanced pupils; and (2) the need for an awareness of the thought level at which an individual pupil is functioning and to assist him, through pacing, to function at higher levels. It is possible that one form of assistance may be through sequences of questions such as those used within this present



study. Rawson (1965) however, considers that there are levels of abstract thinking at which pupils are not capable of functioning, and to ask higher level questions may encourage illogical thinking. While this might be very true in terms of asking questions per se, consideration has not been given to the sequencing of questions as in discussion sessions of this study. It seems plausible to suggest that the pacing of questions within various cognitive levels, in discussions, as was undertaken within this study, may function as an assimilating factor in developing thought.

Support for the notion of directing pupils' thinking in discussion is found in Peel's (1960) concept of the role of the teacher. While Piaget speaks of a schemata process of assimilation and accommodation in thinking, Peel discusses a period of 'gaining insight' into learning (Chapter VII). This period he stresses requires activity on the part of the learner and gives structure from which the pupil can work. While 'insight' may be incorrect at first, and therefore becomes relatively unstructured or crude, it none the less becomes an operational point from which the pupil thinks. Here, Peel states, is the importance of guidance by the teacher, through discussion, in assisting the pupil to rephrase the problem so that his insight grows smoothly. One may infer that guidance 'through discussion' would necessarily involve the asking of questions. This was the interpretation assumed by the researcher in conducting the present study.

Children's thinking, according to Peel, may be studied from a variety of viewpoints. One of these is to study thought from a



psychological point of view as Piaget has done. Another is to study kinds of thinking, in which case thinking is classified by "content and results rather than by processes" (p. 34). Peel identifies four classifications or kinds of thinking that may be found in children or adults: thematic thinking, explanatory thinking, productive thinking and integrative thinking.

The basic mechanism underlying the content of thought, Peel states, is that of relation finding or association, and each of these four kinds of thinking may be considered in terms of psychological differences and complexity between the relationships used (Peel, p. 34). Although Peel does not speak of these forms or kinds of thought as being sequential, he does stipulate that thematic thinking is the simplest form of thinking while integrative thought is found in only the most capable of pupils. The associations within each, however, are hierarchical and in this sense thinking may be considered to range from simple to complex.

In terms of this present study then, pupils might be expected, according to Peel, to demonstrate thinking at all levels of the classification system. The major differences one might expect would be in the complexity of these responses, that is, in the complexity of the associations or relations they can make between component parts. It would be expected then that the quality of responses would vary throughout the group. Furthermore, in terms of kinds of thinking displayed, thematic or free, creative and unstructured thinking would be expected to occur much more frequently than the coordinated thinking of 'integrative thought.'





The development of thought in Russell's view is best studied from the concept of thinking as a 'whole' (Russell, 1956, p. 8). This substantiates Taba's (1964) suggestion that thought viewed as a continuous stream provides a more productive approach to its study. Included in this 'whole' and influencing its development are four main factors: materials, motives, processes, and abilities. Each of these factors in turn relate to six kinds of thinking: Perceptual, Associative, Inductive-Deductive, Problem Solving, Critical, and Creative thinking. These kinds of thought however, are not discrete types. Because there are overlapping elements within them, they differ only in the degree of complexity of the relationships established in each.

In addition to kinds of thought, there are, according to Russell, six rather similar stages of thinking that occur in all types of thought. These, he claims, illustrate further the fact that "thinking cannot readily be divided up into separate types, that there is a unity to thinking processes" (p. 15). These six stages are as follows:

- (1) an initial stage of thinking or tension created by a stimulus
- (2) the establishing of direction in thought
- (3) a search for related materials
- (4) the patterning of ideas into a hypothesis or tentative conclusion
- (5) the analysing and exploring of the hypothesis or tentative conclusion



- (6) verification of the hypothesis or tentative conclusion by subjecting it to the test of use.

The basic difference between the kinds of thought Russell has identified lies in the amount of direction and organization in these stages. While perceptual thinking is relatively unorganized and associative thinking loosely organized, for example, inductive-deductive thinking shows much more organization in that specific details have to be brought together in some conclusion. Imaginative thinking and problem solving on the other hand, are more extensively organized. "Thus, the amount of organization and the complexity of the relationships among ideas are rather distinct in the six varieties of thinking, and [may] vary considerably from one occasion to another" (Russell, p. 19, insertion added).

Russell's view of pupils' thinking is somewhat more complex than that of Peel. Though both identify the amount of organization within a response as the distinguishing factor between the kinds of thought, Peel presents a number of influencing factors affecting the whole process of thinking. Should a pupil within the present study, for example, fail to evaluate, analyse or synthesize adequately, his problem may relate to either factors of the material, his motives, the processes he uses or the ability he has to perform at these levels. On the other hand, his failure may relate to a breakdown in any one of the six stages that relate to each kind of thinking. Should he experience difficulty in his search for related materials of stage three, for example, or in the patterning of his ideas into a tentative conclusion of stage four he will not be able to proceed



to give an adequate response to the question asked.

In summary, the references quoted in this section demonstrate the divergency in approaches to the study of children's thinking and thinking processes. Notwithstanding this however, certain common elements about thinking and its development can be identified from these studies.

1. Thinking changes with age and is influenced by environmental factors, experience and intelligence.
2. Thinking may vary greatly among children in the extent to which it is developed.
3. Thinking ranges from simple to complex and can be identified within various patterns. These patterns may be described by such terms as kinds, types, levels, etc..
4. There are processes, stages or steps through which thinking develops.
5. The acquisition of complex structures in thinking is a continuous process involving the organizing, associating or relating of ideas or concepts in some manner. This acquisition requires 'use,' 'practice' or 'active involvement' of some form.

Related to these aspects, and requiring further study, is the role of the educator.

#### THE RELATION OF READING COMPREHENSION TO THINKING

The dear people do not know how long it takes to learn to read. I have been at it all my life and I cannot yet say I have reached the goal (Goethe).

These words, spoken by the philosopher and poet Goethe, at the





age of eighty (Melnik and Merritt, 1972, p. 1), reveal a dimension of reading that goes beyond the mere decoding or pronouncing of words in print. By thus acknowledging an element of 'illiteracy' the achieved scholar has indicated a concept of reading that has been postulated by educators over the past seven decades or so. This concept is one of viewing reading as a thinking process (Huus, 1971; Smith, 1969; Spache, 1963; Stauffer, 1959; DeBoer, 1946; Gans, 1940; Thorndike, 1917). Thinking, according to these writers, means engaging in various mental processes in order to understand, get meaning from or 'comprehend' the printed page. Hence the term reading comprehension has evolved. While the term 'comprehension' has held a variety of connotations for many writers over the years, in the past quarter-century it has been popularly defined as reading beyond the printed page (Huus, 1971; Smith, 1969; Russell, 1963; Stauffer, 1959). This undoubtedly was Goethe's interpretation.

There has not been a complete consensus of agreement upon this definition of comprehension, however. Simons (1970) for example, defines the comprehension process as "the mental operations which take place in the reader's head while he is reading" (p. 340). These operations he points out are unobservable and consequently only the products, i.e. "behaviors produced after comprehension has taken place," are observed in the form of answers to questions. Simons does not attempt to suggest what these 'mental operations' might be, for to do so would present, one assumes, an illogical situation. The definition however, is a rather unconstructive one for educators.

Smith (1969) meanwhile, identifies 'a new era' which vigorously



urges "that we couple thought and reading; that we go far beyond the stage of picking up what the book says, and use our higher mental processes in thinking about what it says" (p. 249, underlining added). This concept gives an extended view of comprehension in comparison to Simons', and has generally gained support among reading authorities and educators (Smith, 1969; Spache, 1963, Betts, 1961).

#### Investigation of Thinking Processes in Reading Comprehension

Defining comprehension as a thinking process necessarily requires identifying processes. The investigation of precise thinking processes such as those identified by Piaget in reading comprehension however, has been minimal (Rawson, 1969). Studies in this area appear to be more analytical studies of reading comprehension in which thought processes are not clearly identified but the result of the processes categorized by levels or kinds of comprehension varying from simple to complex (Huus, 1971; Barrett, 1968; Cleland, 1965; Smith, 1963; Spache, 1963). This section reviews the research of Rawson and the writings of the analysts.

An investigation into the relationship between Piaget's (1963) stage of concrete operations and reading comprehension was undertaken by Rawson (1969). Selecting a sample of 100 fourth graders, who were "normatively" at the concrete level of development, Rawson administered a set of concrete and abstract tasks individually to each pupil. The abstract tasks were stories which the pupils could read while the corresponding concrete tasks were replicas of Piaget's tasks in conservation, classification, deductive and inductive



thinking, and probability reasoning. Scores in these tasks were also compared with scores on a standardized reading test in order to ascertain the extent to which performance in operations of concrete and abstract tasks might be reflected in a standardized test of reading comprehension.

Findings of this study revealed that while fourth graders were more proficient with operations at the concrete level than at the abstract level, the relative timing of acquisition of operations may be different in reading as opposed to concrete situations. Furthermore, comparison of scores between the concrete and abstract tasks and with the standardized reading comprehension test revealed that problems requiring identical logical operations could be more difficult when presented in reading form than concrete form, and that the reading test and the concrete and stories tasks were assessing essentially different cognitive skills. Any failure of pupils within this present study then, to respond to particular questions appropriately may relate to their inability to abstract particular relevant features from the story form. On the other hand however, it is not certain that the processes the pupil might use in responding to the story questions are the same as those that he uses when manipulating concrete objects. Rawson's findings seem to suggest that the medium in which cognitive tasks are presented pupils affects their performance. Furthermore, they suggest that before Piaget's sequence of operations can be transferred to the reading situation, it is necessary to ensure that the differences between reading tasks and Piaget's tasks do not complicate the actual application.





Other comprehensive studies investigating a direct relationship between thinking processes identified by theorists and those involved in reading comprehension were difficult to locate. The apparent scarcity of research in this area testifies to both the complexity of such an undertaking as well as the need for research based evidence in relating reading-thinking skills to stages of cognitive development.

From the analyst's point of view thinking can be classified into various kinds and ranges from simple to complex. This principle has been utilized by educators in setting up classification systems for comprehension skills and levels of comprehension.

Huus (1971) states that there are three levels of comprehension, each involving a different level of mental operation in terms of complexity. First is the literal level where the reader grasps what the book says. This is, according to Huus, the lowest level of comprehension but a prerequisite to higher levels of understanding. At the second level of interpretation the pupil interprets "what the author means" (p. 489). The third and highest level of comprehension is assimilation or "psychological integration" where the reader asks "What does this mean to me?" or "What have I to do with this?" (p. 490). Critical reading as part of comprehension belongs between levels two and three, and requires the making of judgements and evaluations. These three levels are akin to Russell's (1956) levels of thinking in that "they increase in complexity and require progressively higher levels of creative thought, they do not progress sequentially in that the higher levels are reserved for older and



more mature readers than those found in primary grades . . . young children can, at their level of mental maturity, apply these aspects of comprehension to their reading" (Huus, p. 490).

Smith (1963) attempts to clarify the term 'critical reading' within what she calls the 'broad, blanket term' of comprehension (p. 409). Literal Comprehension she defines as the skill of getting the primary meaning conveyed by the exact words, sentences or paragraphs in a text. The Interpretation level of comprehension, a more involved mental process, includes the skill of getting deeper meaning than the literal level. Supplying or anticipating what is not stated such as drawing inferences, making conclusions, noting cause and effect relationships, speculating, making comparisons, and so on, occur at this level. Critical Reading represents the third and highest level of the "hierarchy of reading—for meaning areas" (p. 409). It includes the literal and interpretative levels, but it extends further in that the reader evaluates, passes personal judgement on the quality, the value, the accuracy and the truthfulness of what is read. This definition of critical reading approximates that described by DeBoer (1946, p. 251).

These levels, somewhat identical to those of Huus, and supported by Stauffer (1969), are according to Smith achieved at all age levels and vary only in the degree of complexity in the mental operations the child uses. They are however, affected by such factors as experience and language facility. In addition Smith views discussions with children as "one of the most productive ways of developing ability to get meaning in reading" (1961, p. 15). Part of the



teacher's "special contribution" is the "throwing in of a question or statement here and there" which stimulates pupils to think about what they have read in a particular manner. No mention is made however, of directing pupils' thinking through a sequence of questions as in this present study, which this researcher views as a more organized manner of developing pupils' thinking than Smith postulates.

A number of comprehension models have also resulted from theories of children's thinking. Cleland (1965) tried to explain the thinking processes of comprehension through a six-step construct. Basic to the understanding of any written selection is, according to Cleland, first the understanding of word meanings and the integration of words and ideas presented in connected discourse. This comprises the Perception process. Beyond this level of understanding is the comprehension commonly referred to as 'higher-level' since it involves higher mental processes of synthesis, analysis and evaluation (p. 62). The process of Apperception follows Perception and involves relating new material to one's own experience. The degree of comprehension at this stage depends upon the degree of similarity between the reader's experience and that conveyed in the writing.

The processes of Abstraction, Appraisal, Ideation and Application follow these lower levels with the highest level of the construct being that of application. Here experience is broadened into what Cleland describes as the real test of the effectiveness of pupils' comprehension. While this model provides another view of the mental processes involved in reading comprehension, it does not define the thinking processes within each stage precisely. Furthermore, Cleland





does not provide sufficient information as to the relationship between the processes. There is no precise indication given as to whether the six processes comprise a hierarchy, or the extent to which children at various age levels can be expected to perform within each level.

In order to assist teachers in viewing comprehension within manageable terms, Barrett designed the Taxonomy of the Cognitive and Affective Dimensions of Reading Comprehension (as presented and discussed by Clymer, 1968, p. 14-23). Borrowing somewhat from Bloom's (1956) Taxonomy for classifying intellectual objectives, he divided reading comprehension into five major skill categories or levels: (1) literal comprehension, (2) reorganization, (3) inferential comprehension, (4) evaluation, and (5) appreciation. Within each of these categories, Barrett provides examples of tasks that might result in comprehension at a particular category 'level.' The categories, Clymer (1968) points out, are "ordered to move from the easy to the difficult in terms of the requirements (i.e. mental operations) each category appears to demand" (p. 18). Furthermore, tasks within each category also move from a simple to more complex level. Clymer suggests that both reading purposes and questions can be classified within this system, in order to determine the level of comprehension (i.e. thinking) required of pupils.

Spache (1963) presents a two dimensional model of the thought processes involved in various reading behaviors. His model however is based heavily upon Guilford's (1956) structure of the intellect. In the dimension of mental operations, according to Guilford, pupils may engage in thought processes representing (1) Cognition, (2) Memory,



(3) Divergent Production, (4) Convergent Production, and (5) Evaluation.

These operations, according to Spache, may be related to six aspects of reading: a unit (i.e. a word), a class (i.e. a sentence), relations (i.e. interrelationship of sentences), systems (i.e. the arrangement of sentences in a paragraph), transformations (i.e. the manipulation of paragraphs), and implications (i.e. inferential reactions to paragraphs). If a pupil engages in 'divergent production' of 'transformations' for example, he might 'construct' a paragraph or offer new titles for the paragraph. Or if he were to engage in 'evaluation' of 'implications' he might react to the author's value judgement or examine the author's assumptions and inferences, and so on (p. 66-67). The levels of comprehension or mental operations that Spache identifies do not necessarily represent a hierarchy in the complexity of the process. However, he states that cognition is probably the simplest process but it is not known if it is always simpler than memory. Evaluation he views as "probably among the most complex of the processes, but with a primary child, can appear in a simple judgement reaction" (p. 66). This feature of the model accommodates the general view among theorists that thinking may vary greatly among children while at the same time ranging from simple to complex.

Though the writing of the analysts as presented within this section has not identified precise thinking processes involved within any one level of reading comprehension, they convey the idea of different kinds of reading comprehension. Furthermore it seems feasible



to assume that questions designed within various levels of a continuum from simple to complex as within this study, might approximate and assess the levels of comprehension they identify.

This survey of literature shows that many views or systems of explaining the functioning of thinking processes in reading comprehension have been presented over the past years. While there is by no means research based evidence for these constructs or ideas, they appear to be based upon theories of children's thinking. Although there is no conclusive agreement among writers as to discrete steps which explain the thinking processes in reading comprehension, there is a general consensus of opinion about the following aspects:

(1) Reading comprehension is 'related' to thinking in that it is thinking.

(2) Reading comprehension involves a continuous process of mental operations that proceeds beyond the act of reading a printed page.

(3) Reading comprehension may be expressed in terms of levels of thought processes involved. These vary from simple to complex.

The definition of reading comprehension that provided direction to this study embraces each of these aspects. It can be argued that whenever a pupil is asked whether ideas of a passage are similar, different, related or contrary; or when he is asked to apply information gained from one situation in explaining a new situation encountered in a story, or to analyse the components of a particular problem situation identified in a story; or to evaluate a particular manoeuvre in a story setting as being helpful or harmful to the





general outcome of the event, that one is dealing with thinking as opposed to reading. This Gans (1972) points out as a rather narrow view of reading. It presents reading as a "mechanical process" of discrimination and association "involving recognition and memory but no higher mental processes" (p. 8). It is the view of reading comprehension as a complex thinking process extending beyond the 'mechanical processes' that Gans adheres to and that underlies this study.

#### BLOOM'S TAXONOMY AS A BASIS FOR DEVELOPING QUESTIONING SYSTEMS

Because Bloom's Taxonomy of Educational Objectives was the basic structure from which the Ohio Scales were developed, and consequently the basic structure for formulating and categorizing questions within this current study, it was considered necessary by the researcher to discuss the Taxonomy in further detail.

Bloom's Taxonomy (Bloom, et al., 1956) was devised for the specific purpose of providing educators with a system for classifying educational objectives or goals. It was an attempt to classify "the intended behavior of students" in such a manner as to allow educators to become aware of the emphasis they might be giving to certain cognitive behaviors as opposed to others (Bloom, 1956, p. 12). By classifying objectives within the cognitive domains of the Taxonomy, teachers could not only perceive the emphasis given to certain cognitive behaviors but also become aware of the cognitive processes which reputedly must underlie the achievement of each particular objective. According to Bloom the system is applicable to all content



areas since it is the cognitive or thinking processes used in achieving a particular objective that are being categorized as opposed to subject matter itself.

Bloom in the Taxonomy organizes thinking behaviors according to six levels: knowledge, comprehension, application, analysis, synthesis and evaluation. This system is further defined by sub-systems within each level that provide for precise categorizing of thinking behaviors. The levels he claims are both hierarchical and cumulative in that any given category includes the behaviors of all lower-order categories. They range from the least complex level of knowledge to the highest and most complex level of evaluation.

The validity of this purportedly hierarchical system however, remains to be established through empirical research. Only a few studies have investigated this aspect and findings have been such as to neither prove or disprove its validity while at the same time providing evidence that indicates in a general way the existence of a hierarchy.

Support for the validity of the hierarchical arrangement of the levels within the Taxonomy was found by Wheatley (1975). The Taxonomy was used to construct laboratory activities for students in a Biology 100 university class, designed to teach for the higher levels of the cognitive domain, i.e. analysis, synthesis and evaluation levels (p. 102). Analysis of posttests administered after completion of units of work, indicated a general decrease in correct responses for items at successively higher cognitive levels. This decrease in correct responses, Wheatley claims, provides evidence



supporting the hierarchical concept of Bloom's Taxonomy (p. 103). Furthermore, when levels were grouped into lower level (Knowledge-Comprehension), middle level (Application-Analysis) and upper level (Synthesis-Evaluation) correlations among these grouped cognitive levels suggested that for the tests used the student performances showed the same hierarchical tendency that Bloom points out in his cognitive taxonomy. The lower cognitive levels correlated more highly with the middle levels than they did with the upper cognitive levels, and the upper cognitive levels correlated more highly with the middle levels than they did with the lower levels.

Only general support for the hierarchical structure of the Taxonomy was found in an earlier study by Stoker and Kropp (1964), however. This study was two-fold in that it was designed to investigate (1) the empirical validity of the Taxonomy, and (2) whether or not judges can agree on the cognitive process which an item is intended to measure (p. 39).

Two reading comprehension tests consisting of 36 multiple choice items relating to the content of science passages were designed for the study. Items were generally equally divided among the major categories of the Taxonomy. These experimental tests were administered to one thousand students of two four-year high schools. Further information regarding the administration of these tests is not disclosed within the report, however.

Analysis of the data collected revealed that the mean performance decreased as the process complexity increased and that the mean performance on categories increased as the grade level increased for





all levels within the Taxonomy, except at the evaluation level. While this evidence gives partial support to the existence of a hierarchical structure within the Taxonomy, it suggests according to Stoker and Kropp, either a possible misplacement of the evaluation category or poorly constructed test items within that level. Since none of the test items were published no assessment of the evaluation items can be made. Furthermore, since no indication was given as to (1) what percentage of rater agreements were essential for items to be included in the experimental tests and (2) what proportion of rater disagreements on items used in the test related to the categorizing of evaluation items, no conclusive statements can be made.

Further general support for the existence of a hierarchical structure within the Taxonomy was found however, when random samples of combined scores were investigated. When scores on knowledge and comprehension were combined, performance on the remaining subtests increased. Also it was found that for any given level of combined score on knowledge and comprehension, the score on the remaining subtests decreased as the complexity increased, except for the evaluation subtest.

When Guttman's Simplex Analysis however, was applied to some twenty correlation matrices to determine if the Taxonomy was hierarchical from knowledge to evaluation according to complexity, none of the matrices satisfied the requirements of a perfect simplex. However, in approximately one-half, the knowledge, comprehension, application and analysis subtests were ordered correctly thus indicating a hierarchical structure within these levels. However



the evaluation and/or synthesis subtests were repeatedly out of order. Such evidence, while it does not support an overall hierarchical structure within the Taxonomy, suggests a hierarchy within the four lower levels.

With respect to the objective of inter-judge agreement for the Stoker and Kropp study, the researchers conclude that "raters do tend to categorize items in congruence with the category—behaviors the items were intended to evoke" when such classification utilizes the levels of the Taxonomy (p. 40). However, it is not clearly defined with what reliability this "tendency" was calculated. While 11 of the 36 items were unanimously classified congruent with the intended categories on both of the tests, the inter-judge agreement for the remaining items is given merely in descriptive terms. No statistically calculated evidence in a form that would indicate an acceptable level of agreement to ensure that raters do in actual fact agree on the cognitive processes which an item is intended to measure was presented. This aspect of the study might therefore be considered suspect.

Conclusions drawn from this study can only be interpreted in terms of the limitations within it. A point of concern to this researcher is whether or not evaluative thinking or in fact, thinking at any of the higher levels including analysis, application and synthesis can indeed be measured through the use of multiple choice questions. Because answers are already provided, the thinking processes by which a selection is made are nebulous. This leads to a further question. Does the analysis of pupils' responses necessarily invalidate the purported hierarchical structure of the



Taxonomy? It is plausible to assume that questions have the potential of directing thinking to a particular level, but whether or not that level is achieved in terms of the response given may well reflect inadequacies in the ability of the pupil to think at that level rather than inaccuracies in the hierarchical structure. When answers are oral and given in response to open-ended questions as opposed to short answer multiple choice, as in the present study, the opportunity exists for developing with greater certainty an awareness of where the weakness lies.

Kropp et al. (1966) point out some of the extreme difficulties faced by researchers in attempting to validate the Taxonomy. Choosing the conditions under which observations will be made and response measures collected, and choosing a response measure which will be regarded as indicative of the presence or absence of certain cognitive behaviors, are two of the critical problems he identifies. One can only conclude at this point that while sound evidence supporting the validity of the construct is not yet available, there exists general support in favor of the hierarchical structure. For the purpose of this present study the structure was assumed hierarchical.

Meanwhile the Taxonomy is of growing importance to educators as a tool for measuring the cognitive processes of students. It has furthermore become a basis for devising modified systems for classifying teacher and pupil questions as well as student responses. Certain of these are discussed in the following section.





### Question-classification Systems

In order to study the questioning practices and verbal behavior in classrooms, a number of systems for classifying questions have been developed. Generally these systems make a logical analysis of the cognitive areas of comprehension and express the cognitive processes along a levels continuum. Gall (1970) identifies eight such systems and organizes the categories within these in a manner that indicates similarities between them. He concludes that Bloom's Taxonomy best represents the commonalities that exist among these systems, thus indicating that the Taxonomy has become the basis for devising several questioning systems. Four of these systems will be reviewed and their relationship to Bloom's Taxonomy presented in diagram form.

Sanders. The most noteworthy individual for extending Bloom's Taxonomy beyond a system for classifying educational objectives to a system for classifying questions is Sanders (1966). In a rather comprehensive handbook for teachers he discusses guidelines for the writing of questions at each level of the Taxonomy. He replaces the Knowledge category of Bloom's system, however, with the term Memory, and condenses the Comprehension category with its four subdivisions into two separate categories of Translation and Interpretation. The categories however, are similar to Bloom's in that they evoke the same thinking processes as Bloom intended and are hierarchical in their arrangement. Instead of the six original categories established by Bloom, Sanders presents the following seven categories: Memory, Translation, Interpretation, Application, Analysis, Synthesis, and Evaluation.



Researchers utilizing the Taxonomy for classifying questions tend to use the modified Sanders' version generally referring to it as the Bloom-Sanders Taxonomy, or in some manner indicate joint reference (Hunkins, 1972; Davis and Tinsley, 1968; Wolf, 1967).

Guszak. For the purpose of describing reading comprehension skills as determined by teachers' questions, Guszak (1967) developed a Reading Comprehension Inventory for classifying the types of questions that teachers asked elementary school children. His selection of "the common elements" among researchers' and writers' views of what is thought to comprise comprehension skills, resulted in the formulation of the inventory. Relying on the Bloom-Sanders Taxonomy and the Aschner-Gallagher Category System for classifying levels of thinking, he utilized the following levels in his sequential construct: Recognition, Recall, Translation, Conjecture, Explanation, and Evaluation. Although each level within the system is adequately defined, there appears to be only two levels which might be classified as higher levels of thought, i.e. Explanation and Evaluation. Problems appear to arise however, when one attempts to categorize thinking that involves application and analysis within these levels. The upper limits of the system do not easily facilitate the categorizing of these cognitive processes and for this reason Guszak's system was not utilized by this researcher.

Wolf et al. The levels of thinking which Bloom identifies in his Taxonomy were also modified by Wolf et al. (1967) in devising an observation instrument for classifying the verbal behavior of teachers.



Certain of the subcategories were not utilized in developing the instrument and others were combined or renamed, resulting in an eight category structure consisting of the following categories: Gathering Specific Facts, Clarifying, Interpreting, Analysing, Applying, Summarizing, Evaluating and Controlling. The final category of Controlling however, does not represent part of the cognitive levels continuum but was provided for classifying comments or statements of a managerial nature. This system is part of a scale identified by Davidson (1970) as the Ohio Scales which is composed of two related category systems—one for classifying teachers' verbal behavior and one for classifying pupils' verbal responses. The latter system however, was devised not from Bloom's cognitive levels but from the five major groups of intellectual abilities identified by Guilford (1956). This dual scale, refined through several preliminary observations of classrooms and through the use of tape recorded discussion of reading materials, provides a means for recording verbal behaviors both vertically and horizontally. The comprehensive nature of the Ohio Scales, together with its clearly defined categories and provision for classifying student responses and teacher verbalizations on a single continuum, tends to make it an efficient instrument for classifying verbal behavior of the classroom in the view of this researcher. Because of its comprehensive nature it was used in this study in classifying student and teacher verbal behaviors. A complete description of the scale can be found in Appendices L and M.

Hunkins. The most comprehensive writing in the area of questioning systems and techniques has been done by Hunkins (1972). Utilizing the





Bloom-Sanders version of the Taxonomy he demonstrates how questions can not only be classified within all levels of the taxonomy but might be arranged in a particular sequence or questioning strategy. In a rather unique way he combines the teaching strategies of Taba (1967) and demonstrates how her concept of focusing, expanding, raising and lowering the thinking levels of pupils can be applied at all levels of the Taxonomy.

While Hunkins' orderly presentation provides a precise system for classifying questions and a questioning technique for discussion purposes, it remains essentially a theoretical model. Because the questioning strategy he postulates has not in actual fact been implemented in a teaching-discussion situation, it consequently tends to give, in the view of this researcher, an oversimplification of the whole process. The combined work of Taba (1967) and Hunkins (1972) became the basis for this study. A more detailed account of these systems and questioning techniques, and of the problems encountered in implementing these models in directing reading discussions can be found in Chapter IV.

#### QUESTIONING PRACTICES WITHIN TEACHING

There appears to be almost unanimous agreement among educators that one of the most potentially useful tools for stimulating and directing thought processes is the question. Ruddell (1974, p. 366) identifies the question as "a basic and commonly accepted tool used to stimulate thinking and enhance the cognitive process and comprehension ability." In Taba's view, questions and the art of asking



Table 1  
Bloom's Taxonomy and Sanders' Question Classification System

Bloom's (1956) Taxonomy		Sanders' (1966) Adaptation	
Main Categories	Sub-categories	Main Categories	Sub-categories
Knowledge	Of Specifics Of Terminology Of Specific Facts Of Ways and Means Of Conventions Of Trends and Sequences	Memory	Facts Definitions, Generalizations and Values
		Translation	
Comprehension	Translation Interpretation Extrapolation	Interpretation	Relationships of: Comparison; Implication; Inductive Generalization to Supportive Evidence; Value, Skill or Definition to Example of Its Use. Quantitative Relationships; Cause-Effect Relationships
Application		Application	Behavior-centered Subject-centered Application of Skills
Analysis	Of Elements Of Relationships Of Organizational Principles	Analysis	Induction Fallacies Deduction
Synthesis	Unique Communication Production of a Plan Derivation of a Set of Abstract Relations	Synthesis	
Evaluation		Evaluation	



Table 2

The Question Classification Systems of Guszak, Wolf et al. and Hunkins

Guszak (1967)	Wolf et al. (1967)	Hunkins (1972)
Main Categories	Main Categories	Main Categories
Recognition	Gathering Specific Facts	Knowledge
Recall	Clarifying	Comprehension
Translation	Interpreting and Inferring	
Conjecture	Analyzing	Application
	Applying	Analysis
Explanation	Summarizing and Concluding	Synthesis
Evaluation	Evaluating	Evaluation





them play a crucial role in focusing, expanding and directing thinking in a teaching strategy (Taba, 1965, p. 538). The purpose for asking questions in Hoskisson's words should be "to foster reflective thinking" (Hoskisson, 1973, p. 159). And, according to Smith (1961), the whole process of questioning is a co-operative venture for the purpose of exploring ideas and expanding knowledge.

Excerpts such as these can be found among numerous writings related to the effective use of questions. The extent to which these beliefs about questioning are evidenced in the classroom is not surprisingly the topic of much research.

Over half a century ago it was disclosed by Stevens (1912) that questioning comprised a large portion of the teacher's daily verbal output. By observing a number of high school teachers she found that a mean number of 395 questions were asked daily, and estimated that four-fifths of school time was occupied with question-and-answer recitations. Some fifty years later, Flanders (1963) supports this statistic. He reports that the asking of questions and the giving of information accounts for 70 to 90 percent of teacher talk. This high frequency of questioning activity has also been verified by Floyd (1960), Moyer (1965) and Schreiber (1967) as occurring within the primary and elementary classrooms.

It would appear then that questioning is a significant procedure within the classroom in terms of time spent in questioning activities. The crucial question and that which directed this study however, is not the proportion of time spent in asking and answering questions, but the effectiveness of this practice in terms of



developing pupils capable of thinking. Several studies investigating this aspect reveal a wide discrepancy between the potential of questions, as cited by the educators, in developing thinking individuals, and the actual classroom practice.

Floyd (1960) in an investigation of the quality and type of teachers' and pupils' questions studied forty "best" primary teachers in selected Colorado schools. Data collected reveal rather discouraging practices indeed. Teachers asked 53 percent memory type questions and fewer than 100 of the 1347 questions asked by the forty "best" teachers were judged capable of stimulating reflection. Furthermore, slightly more than six percent of the questions were judged worthy of thinking about and answering. Although analysis of the worthiness of teachers' questions showed a certain amount of subjectivity on the part of the researcher in terms of the classification system used, verbatim transcripts of selected lessons included in the appendix of the study indicate a large amount of verbiage on the part of the teacher that is not productive. Repetition of questions, and the asking of questions that encouraged guessing and required little thought to answer, frequently occurred throughout the lessons. Such questions might therefore be classified as unworthy of thinking about.

Procedures such as these were also noted by Schreiber (1967). In a study of fifth grade social studies teachers a prevalent use of recall type questions requiring only the giving of factual information was found. Questions requiring pupils to draw conclusions and make evaluations were seldom asked. Similar findings as these caused



Guszk (1967) to conclude "that about the only thing that appears to be programmed into the students is the nearly flawless ability to anticipate the trivial nature of the teacher's literal questions" (p. 234). Transcriptions of teachers' questions and pupils' responses in primary and elementary classrooms over a three day period further revealed that although 15.3 percent of the questions asked were rated as evaluation, there was serious doubt as to the thinking depth they required since nearly all required 'yes-no' responses that were not supported. Guszak adds that if educators want to condition students for irresponsible citizenship, it seems quite appropriate to ask children for unsupported value statements.

A year later Davis and Tinsley (1968) again verified the findings of Guszak and Schreiber, only this time among student teachers and their pupils. Both teachers and pupils asked more 'memory' questions during forty-four social studies lessons than all other questions combined. When translation and interpretation categories of questions were combined under the term 'comprehension' no other cognitive objective seemed to have been effectively operational in the forty-four classrooms. This, it is concluded, provided only a meager intellectual atmosphere within the classroom. Furthermore, in this researcher's opinion, it makes questionable the adequacy of teacher training in this particular area, and demonstrates a need for exploratory studies similar in nature to this present undertaking.

Mueller (1972) expanded the inquiry into teachers' questions to include questions within instructional materials. Her objective





was a two-fold one: to analyse the thinking processes fostered by textbook questions and to discover what congruency, if any, existed between teachers' verbal behavior and that suggested within the text. Data was collected by taping eight fourth-grade classes during reading lessons, and by analysing the basal reader guides for these grades. Her findings support those already discussed in that teachers asked more memory questions than any other kind, regardless of the level of the group or the text used. The text meanwhile, generally provided questions of a closed type, tightly structured and requiring a specific answer. A rather astounding discrepancy was found between the questions provided in the text for below-average readers, i.e. those pupils requiring reading materials below grade level, and those for pupils classified as average or above readers. "Nearly two-thirds of the questions found in the text for below-average readers were at the cognitive memory level, while more than one-half of the questions in the text for average readers were convergent in type, requiring the student to analyze and integrate given or remembered data" (p. 143). This finding prompted Mueller to raise two pertinent questions: What rationale underlies the kinds of questions provided by the text for teacher use? and, "is it assumed . . . that fourth grade pupils reading in the below-grade level text are not yet ready for higher level thinking . . .?" (p. 143). With respect to this latter question, however, the research of Taba (1966) and Wolf et al. (1967) in training elementary pupils to think at the higher cognitive levels, gives evidence that such an assumption is indeed contrary to pupil performance under specific instructional techniques.



The concerns of Mueller, however, were also those of Davis and Hunkins (1966) in a previous study when a survey of fifth grade social studies textbooks revealed similar findings. Only one out of eight questions required pupils to "think with their knowledge rather than remember it only" (p. 289). Of major note in these findings was that none of the questions required analytic thinking, only one question required pupils to engage in synthesis and two questions required evaluative thinking. All textbooks studied revealed in the researchers' words "a uniform neglect of the higher mental operations" (p. 289).

It appears from the questioning practices found within classrooms and within texts, as disclosed by the studies cited, that the educators' views of the question as a valuable tool for promoting thinking processes are not born out in actual practice. Such findings as these prompted this present study.

In order for teachers' questions to be effective stimulators of thought, there must first be "an awareness of [the] various purposes that questions may serve and an awareness of [the] different types of questions for achieving these purposes" (Pate & Bremer, 1967, p. 422). It is not unrealistic to assume then, that a major part of the existing problem in questioning, relates to a lack of awareness in these areas on the part of teachers. Pate and Bremer (1967) discovered "a surprising number of teachers . . . unable to give readily as many as three purposes served by questions" (p. 419). Rogers (1972) also claims that teachers not only lack necessary skill for asking effective questions but also receive little or no guidance in terms of clear



strategies set out by either research or training programs related to how effective questioning techniques are developed. While this may be a valid argument to defend classroom practices it is interesting to question what effect (1) training would have upon teacher performance and (2) higher levels of questions would have on pupils' thinking if they were in fact initiated. It was toward gaining insight into this latter aspect that this present study was directed.

#### EFFECTS OF QUESTIONING ON PUPIL PERFORMANCE

The relationship between the kinds of questions teachers ask and student performance appears to have become the focus of studies as an off-shoot of research findings already cited. The underlying assumption for studies in the effectiveness of questioning upon pupil performance was that postulated by educators: the level of thinking stimulated by questions is positively related to the level of questions posed (Taba, 1967; Guszak, 1967).

Kleinman (1965) investigated this aspect of questioning in an exploratory study involving seventh and eighth grade science teachers and pupils. By observing a total of twenty-three teachers in a preliminary part of the investigation, three teachers were selected as high in their frequency of asking critical thinking questions, and three were selected as low, since their lessons were devoid of such questions. These teachers and their pupils were assigned the title of 'high-group' and 'low-group' respectively. Recordings of questions and answers during four class lessons with each group were made and analysed. To obtain a measure of





understanding of science The Test of Understanding Science, Form Jy was administered. Because reading ability was a factor affecting the understanding of this particular test, and consequently the overall performance, pupils were divided into high, average and low-in-reading ability groups. Comparison of performance of the 'high-group' with that of the 'low-group,' omitting the low-ability-in-reading pupils, was significant at the 0.01 level of confidence. Adding the low-ability-in-reading pupils changed the significance to the 0.05 level of confidence. Kleinman states that "one may cautiously conclude that the high ability pupils . . . who have teachers that ask critical thinking questions, have a better understanding of science, of scientists and of the methods of science than the same caliber pupils of teachers who do not ask critical thinking questions" (p. 315).

While this study indicates a positive correlation between the level of questions asked and pupil performance, it can only be considered suggestive in terms of the limitations within the exploratory design. Because stringent controls were not implemented nor a treatment in the form of critical thinking questions administered, one cannot be certain that the influencing factor in pupil performance was the critical thinking question per se. The suggested value of the study however, must be recognized.

The relationship between question type and student achievement was further investigated by Hunkins (1966). For a four week period an experimental and a control group of sixth grade social studies pupils responded in writing to question worksheets relating to text



materials. The experimental group responded to a dominant use of analysis and evaluation questions, as defined by Bloom's Taxonomy, while the control group responded to questions that stressed knowledge only. Answer sheets were provided with which the students could evaluate their own work when finished. Those students responding to analysis and evaluative type questions showed a significantly higher achievement gain than the students responding to knowledge questions. Hunkins purports that the higher cognitive level questions enabled students to think about relationships in information and to evaluate it in terms of relevancy to the particular problem situation, and required them to think actively with the information. Those responding to low-cognitive level questions were not stimulated to engage in such thinking. In terms of critical thinking, however, there was no difference between groups.

While the Hunkins' study offers supportive evidence for the relationship between question type and student achievement and thus supportive evidence for conducting this present study, certain limitations must be noted in interpreting the results. The fact that students were required to give written answers during the treatment period, and responded to multiple-choice questions on a posttest gives rise to the question of whether the achievement posttest provided an adequate measure of the effectiveness of the treatment. A criticism of this feature of the study, made by Gall (1970) is that the multiple-choice testing procedure distorts Bloom's Taxonomy and hence influences the results. Attempting to put evaluative type questions into a multiple-choice format when there is no correct answer to this type



question is, according to him, a disputable point. Furthermore, a point of query for this researcher is the likely inhibiting factor of monitoring one's own responses during the treatment period. The questioning process was not an interactive one whereby the pupils received verbal feedback to their responses, or were confronted with further questions that could extend and direct their thinking when a response was incorrect, inadequate or incomplete as in this present study. In spite of these limitations, however, the study is acknowledged by Gall (1970) in his review of educational research as the most important work to date, in investigating the effect of teachers' questions on pupil behavior.

A verbal interactive process in questioning however, was utilized in a study by Davidson (1970). Claiming that it seemed plausible to assume that major differences in the kinds of questions asked during reading lessons would influence differences in the types of pupil responses, she compared, through investigation, the results of two teaching strategies: (1) the Direct Reading Activity (DRA) approach as set out in basals, and (2) a Direct Reading-Thinking Approach (DRTA) as designed by Stauffer (1969). Nine fourth-grade teachers were observed and taped as they conducted one lesson using each method. All questions and responses were transcribed and categorized according to the Ohio Scales (Wolf et al., 1967). While the number of questions remained approximately the same for both methods, they differed significantly in kind. The DRTA method allowed for the asking of significantly more interpreting, inferring and evaluating questions while the DRA method tended to elicit more





fact gathering questions. Correspondingly, pupils' responses using the DRTA method were classified as higher-level responses while those elicited by the DRA method were generally literal responses.

These findings are further supported by Ryan (1973) who investigated the effects of questioning levels upon fifth and sixth grade geography pupils. Results suggested that high cognitive level questions lead to greater student achievement at all levels of understanding. Furthermore, there was indication that higher level questions should be posed in some systematic manner. These findings, however, are subject to the same limitation as identified by Gall (1970) in the Hunkins' (1966) study. The fact that the posttest was a multiple-choice, written test, unlike the technique of oral questioning used during the treatment period raises the same question of adequacy: Did it provide an adequate measure of the effectiveness of the experimental conditions?

Findings of the Ryan study however, were further verified by Willson (1973) and Ladd (1970) which lend further support to the hypothesis that the level at which the teacher interacts with the pupils will be reflected by the level at which the pupils respond. The findings of Willson (1973) led him to conclude that "In order to improve the level of cognitive processes in the classroom, it is necessary to raise the level of the teacher's cognitive processes which will be reflected in the level of the teacher's questions . . . ." (p. 28).

There appears to be thus, overwhelming support from research findings for a positive correlation between the kinds of questions



teachers ask and pupils' thinking performance. It is these findings which give impetus to the need for this present study in exploring how effective a questioning strategy might be in directing pupils' thinking within the higher cognitive levels.

#### THE ART OF GOOD QUESTIONING

Much has been written about questions and questioning procedures over the past quarter century. From the literature and research cited in previous sections we know a number of pertinent facts related to the practice of questioning:

1. Questions can be classified according to systems;
2. A number of classification systems have been devised that are hierarchical in nature and indicate cognitive processes that questions at various levels within the hierarchy evoke;
3. Questions can be organized in a strategy for teaching purposes;
4. The level of thinking stimulated by questions is positively related to the level of question posed;
5. Questioning is one of the most frequently used 'tools' within the classroom setting; and of a more negative nature,
6. Teachers tend to be rather unskilled in the questioning techniques they demonstrate within the classroom.

Each of these aspects however, is relevant to the total questioning process, yet of necessity for research purposes, each has been studied as an isolated segment. Questioning however, is a complex interactive process between teachers and pupils. It involves a



variety of inter-related aspects. These undoubtedly are more easily explained as separate entities rather than as integral parts of the whole complex process.

What is the key to successful questioning? What specific procedural techniques or skills are essential for conducting a questioning session, and how does one acquire or learn these skills? It was in these specific areas that a scarcity of explicit advice was noted by the researcher. This same deficit in information was also observed by Rogers (1972) and Gantt (1970). The literature, however, is full of opinions and clichés about questioning. Statements such as the following were frequently found:

A mature and functional as well as aesthetic learning milieu includes both competent adults and inquisitive children involved in multi-directional instructional activities (Hoskin & Swick, 1973, p. 567).

Asking questions—in class discussion or on assignments and tests—is one of the basic ways by which the teacher stimulates thinking and learning (Aschner, 1961, p. 44).

The teacher's purpose should be to find an answer to his own question by involving the pupils in a discussion, trying at the same time to be aware and fully understanding of the questions asked. The reflective process should be at work . . . (Hoskisson, 1973, p. 159).

Such statements, unfortunately, provide only general implications for questioning procedures as opposed to clear strategies. However within the literature, there are fragmented pieces of advice and evidence which, cumulatively, can provide direction in the actual conducting of questioning sessions. Bellack (1966) identifies a common questioning cycle within classrooms that is comprised of three components: the teacher's question, the pupil's response and the teacher's reaction to that response. While a questioning period may





not rigidly comply to this format, and for effective discussions the literature postulates greater pupil participation that would reflect a cycle such as teacher—pupil—pupil—pupil—teacher, the cycle would none the less involve three aspects: (1) the soliciting of a response; (2) pupil responses and (3) reaction to the responses.

Consideration of the literature and research related to these phases provided greater insight for this researcher into the intricacies within each phase.

### Soliciting Responses

One of the key features of asking questions according to Smith (1961) and Hoskisson (1973) is the purpose to which questions relate. Questions, according to these writers, should be thoughtfully planned in conjunction with a defined purpose, and taking into consideration the pupils' experiences with the subject matter. For this reason, questions should begin with the known and work toward developing reflective thinking with respect to the unknown. The Far West Laboratory for Educational Research and Development (1968) (hereafter referred to as the Far West Laboratory) stipulates that in order to achieve a predetermined purpose it is necessary that questions be prepared before class and answered by the teacher. This helps determine what the pupil needs to know in order to give a satisfactory response, particularly where high level questions are concerned, and provides opportunity to formulate other possible questions that may need to be raised. A word of warning however, is given with respect to phrasing questions. Careful phrasing is essential to ensure the question is not ambiguous, unclear or otherwise confusing. On the



other hand, however, good questions will not guarantee adequate responding since the question is only part of the whole process. Having a question clearly phrased, however, reduces the possibility of inadequate responses.

There are, as Hoskisson (1973) points out, two kinds of questions, each dependent upon the purpose of the teacher. He differentiates between "false" questions and "true" questions. If the purpose is to have the pupil answer questions for which the teacher has the correct answer, then the question becomes "false" since they do not encourage reflective thinking but merely guessing what the teacher has in mind. The "true" question however, is that for which there are several possible answers and the teacher is willing to entertain any which the pupil might pose. This question type would necessarily be the open-ended question which allows for reflective thought and multiple responses. It is not to be assumed, however, that the short answer, factual question serves no purpose in the questioning procedure. Such questions are often necessary when bridging the gap between the known and the unknown (Sanders, 1972; Gantt, 1972).

Because outcomes cannot be predicted when using open-ended questions, exact questioning procedures cannot therefore be programmed (Smith, 1961). Many of the questions that will be raised throughout the discussion will consequently be the result of pupils' replies. While an overall general plan of questioning is essential for discussion purposes the key feature, according to Smith, is that the initial exchange of questions and answers serve as a means for exploring and reconstructing ideas that in turn lead to productive thinking. Once



the question has been put before the pupils, however, it should be left long enough for the pupils to think of an answer. Repeating parts of the question, withdrawing portions of it, adding, rewording, explaining or modifying the question in any way prior to a response, are all procedures which Austin (1949) considers confusing and distracting. Consequently, they are to be avoided. Because "yes-no" answer questions encourage guessing, Austin further feels that these should be avoided if possible. On limited occasions when they might be asked, support for the answer given should be requested of the pupil. In a similar manner elliptical questions tend to provide too much information for the student while requiring little thinking on his part, and therefore should be used cautiously. If not overworked, however, they can be useful and help give variety in the discussion (Austin, 1949, p. 53).

In summary then, the writers suggest important aspects related to soliciting pupil responses. Having a clearly defined objective or purpose, planning questions in written form around this purpose beginning with the known, utilizing a large percentage of open-ended questions, and using discriminatively yes-no and elliptical questions appear to be the main issues. To comply with these, a number of implementations were made in the planning stages of this present study: a generalization strategy for each story selection gave a focus or purpose to the questions asked; and written questions, a portion of which were open-ended, were outlined for each story working from the known. In discussion sessions yes-no and elliptical questions were used infrequently and discriminately.





## Pupil Responses

A common criticism of the question-discussion type lesson is that the teacher's talk pervades the session. Teachers frequently repeat their questions and wait less than two seconds for a response before proceeding to direct the question to another pupil should a response not be forthcoming within that time interval (Rowe, 1969). Furthermore, when a response is given, it is directed toward the teacher. To ensure that a large number of pupils will likely participate in answering questions, and in thinking about the question posed, the Far West Laboratory (1968) suggests that a time lapse of 3 to 5 seconds be allowed prior to calling upon particular students for responses. It is felt that accepting immediate responses encourages a small number of pupils to participate, and encourages brief responses since students take little time to reflect upon the question. Ensuring that pupils will respond to each other rather than always to the teacher, however, is not a simple task. Pupils, the laboratory maintains, have been conditioned to respond to the teacher. Such conditioning is difficult to eliminate.

The Far West Laboratory (1968) in a filmed mini-course for elementary teachers on questioning introduces a redirecting technique which attempts to eliminate some of the inadequate features of questioning. This technique of carefully selecting questions that offer a number of alternative answers, and redirecting the question from one pupil to another within the group by simply calling his name or nodding in his direction, has brought encouraging results. Studies quoted by this laboratory in which the redirecting technique



was used throughout discussions, have showed notable gains in terms of increased pupil participation, decreased teacher talking and pupils responding to each other.

Notable gains in pupil responses have also been found by Rowe (1969) when the "wait-time" for pupil responses was increased. Experiments conducted by twenty graduate teachers studying questioning-teaching techniques in elementary science classes, revealed that when the "wait-time" is increased to five seconds or greater, the length of the pupil's response increases and the tendency to say "I don't know" decreases. Furthermore, there was evidence of more confidence on the part of the pupil as indicated by the voice tone. When short lapse-time intervals occurred after a question, answers often came "with a question mark in the tone, as if to say, 'Is that what you want?'" (p. 12). The researcher concluded that the increased wait-time provided thinking-time for the pupil during which he could reflect and speculate. A general shift from teacher-centered behavior to child-child interaction as pupils worked with materials appeared to be a further outcome of increased lapse-time intervals. Possibly one of the more startling findings, and pertinent to this present study, was the change of teacher expectation for the slower low verbal pupil. Significantly less time was given these poorer students to reply to questions thus indicating a lower expectancy on the part of the teacher for these pupils to perform. When a deliberate attempt to increase the "wait-time" for these pupils was initiated, results showed an increase in responses, gradual at first but then rapid.

Such findings say much to the teacher in terms of the kinds



of questions asked. Does the "wait-time" required to answer higher-level questions differ significantly from the "wait-time" required to respond to a lower-level question? Logically, since higher-level questions involve more complex mental processes in answering them, this would presumably be the case. A study conducted by Arnold, Atwood and Rogers (1974) supports this assumption. Teachers trained in asking questions at the higher levels of Bloom's Taxonomy, and sensitized to the critical problem of allowing pupils time to consider questions and formulate answers, directed question-discussion sessions with small groups of pupils within grades one through five. It was found that lapse-time differed by question level and by response level, but that lapse-time did not increase directly with the hierarchical level of the question. When the pupil responded at the analysis level, he took significantly more time to begin his response than when responding at any of the other levels. A strong relationship was found between "wait-time" and all other question levels and response levels.

The limited literature and research in the handling of pupils' responses within questioning periods, emphasize two important aspects: (1) the utilizing of a redirective technique to reduce teacher talking and increase pupil participation and (2) the need to implement sufficient time intervals after questions are posed to provide for adequate thinking on the part of the pupil, particularly when questions are within the higher levels. In this present study, a deliberate attempt was made to implement these aspects in the discussion sessions.





### Reaction to Responses

The success of questioning however, is more than the posing of questions, whether high-level or low-level, thought provoking or memory (Smith, 1961; Sanders, 1972). It is more than the soliciting and receiving of responses. In the words of Hullfish as quoted by Smith (1961), where situations of teaching pupils to think are concerned, "the question slips into an insignificant position, whereas the manner in which the answer is handled looms up as the important factor" (p. 4). How is the artful teacher to handle responses in a manner that sustains a continuous, thoughtful discourse?

Among the more structured advice available to teachers in this particular area of concern, is the series of films by the Far West Laboratory (1968) already referred to in the previous sections. This mini-course, compiled with the writing of Gantt (1970) in which he outlines, through the use of excerpts from reading discussions, the significance of verbal cues emitted by children that indicate a need for help in thinking, provide more explicit advice for directing responses.

An essential feature in reacting to responses is to treat incorrect answers in an acceptable manner. To do otherwise is to create a psychological upset for the pupil which discourages continued participation (Gantt, 1970; Far West Laboratory, 1968; Austin, 1949). Attempting to find out why the pupil responded as he did through further questioning often reveals a misinterpretation of the question, a lack of awareness of specific word meanings, or insufficient background experience to relate to the question situation. Weak or



incomplete answers should likewise be treated in a similar fashion. Punishment for such responses should be avoided and praise given for what has been stated. In terms of teacher behaviors, what does this involve?

In situations where incomplete but correct responses are emitted, the posing of clarification questions such as: "Can you explain what you mean?" "How does that fit into the question?" or "Can you say that another way?" frequently produce more complete answers (Far West Laboratory, 1968). Refocusing questions that require the pupil to relate or compare an experience or situation to that of his own, to find a parallel, or to express how two things, instances, etc. are related, assist him in clarifying his thinking. Such refocusing techniques that require the pupil to relate answers to other topics, develop an ability to make necessary generalizations which otherwise the pupil is unable to make. However, the Far West Laboratory does not guarantee "prescribed" results. As these films point out, pupils previously allowed to respond briefly or to give memory type responses, are not likely to respond to expectation at first. Persistence and continued endeavour on the part of the teacher must exist.

Clarifying techniques such as those noted above, are referred to as "probes." The type of probe varies with the response, but as Gantt (1970) points out, will often require reducing the initial activity to components and posing questions related to each part. This allows the pupil to obtain sufficient resources to answer the initial question. Probes that are responsive to the pupil will,



Gantt maintains, result in noticeable improvement in thinking. The need for probes is signalled by cues appearing when the pupil:

1. is unable to utter or complete an explanation of a concept.
2. does not interpret what he has said by defining, illustrating, rephrasing or giving an example.
3. repeats irrelevant or disconnected ideas.
4. cannot supply data to support a statement or position.
5. is unable to use data in a related or associative situation.
6. cannot derive logical conclusions or make applications in new situations (Gantt, 1970, p. 16).

Three interfering behaviors to be avoided by the questioner are outlined by the Far West Laboratory. Repeating questions after a brief period of silence, repeating pupils' answers, and answering one's own questions are viewed as unproductive aspects of the question-response cycle. Repeating behaviors on the part of the questioner discourages attentive awareness. As Ladas and Osti (1973) point out, listening is a vital ingredient in communication. Teacher listening to pupil, pupil listening to teacher, and pupil listening to pupil "may very well be the most important part of the questioning cycle" (p. 185). In a similar manner, answering one's own questions after a brief response of silence does not provide for maximum group or class participation. It neither encourages the pupil to engage in a thinking process, nor convinces him of the expectancy for him to do so. In other words, it tells him he is not expected to participate in the communication. There are, however, occasions when practices such as those mentioned should and will occur. When it is believed that because of some distracting element a question or response was not heard by all, repeating is appropriate and necessary. And, as Ladas and Osti point out, it is sometimes a positive approach to provide the answer after a pupil has struggled with the question.





Two additional pitfalls to be avoided are noted by Smith (1961). Never should the questioner or teacher enter in a competition with the pupil to prove who might be the smartest or who might have the last word. In a like fashion, students should not be required to defend every opinion they venture to express (p. 6). Essentially, the purpose of the discourse is to co-operatively explore ideas and discover meaning. Competition has no role in such a process. Furthermore, continuously having to defend ideas or opinions "is likely to cause the student to give up the exploration of ideas in favor of a last ditch defense for the integrity of his own person" (p. 6). There will be occasion then, when the teacher must allow certain responses and remarks to go unnoticed.

The reaction component of the question-discussion technique requires a democratic approach. Ladas and Osti maintain that if a teacher's philosophy is democratic, it follows that students' words are as important to each other as they are to the teacher (p. 184). Participation by the pupils in both questioning and answering is essential. As the Far West Laboratory points out, however, pupils are so conditioned to respond only to the teacher, and furthermore, conditioned to only teachers asking all the questions, that the process of pupil-pupil interaction in both questioning and responding may not be forthcoming without coaching and encouragement.

There is, according to the previously cited literature, no precise formula for ensuring success in the reaction-to-responses component of the questioning cycle. In summary, the following points appear important as guidelines for conducting question-discussion



sessions:

1. Treating incorrect responses as acceptable.
2. Probing, refocusing, clarifying when answers are short and incomplete, though correct.
3. Avoiding interfering behaviors of repeating questions and answers, offering correct answers, and always challenging pupil responses.
4. Encouraging democratic participation where listening, responding and questioning is a pupil-pupil process as well as a teacher-pupil process.

Within the limits of the researcher's abilities these techniques were adhered to in the present investigation. Questioning however, is a complex process and, in the words of Smith (1961), an art we learn by doing.

The beginning teacher, or any teacher beginning to take reflective teaching seriously, should remember, first, that even the master teacher does not bat a thousand, and second, that experiments with reflective teaching . . . indicate that even an experienced teacher does not do as well during the first year of reflective teaching as, with reasonable efforts, she or he can expect to do in subsequent years (p. 5).

How successful this researcher was in implementing the foregoing techniques is an undiscernible aspect of this study.

#### SUMMARY

This chapter reviewed research studies and literature pertinent to the use of questioning strategies in developing pupils' thinking.

The first section of this chapter presented divergent concepts



of children's thinking ranging from the psychological processes involved in thinking to that of levels or kinds of thought classified by content and results rather than processes. A number of elements about children's thinking and its development were identified as common among theorists.

Systems for explaining reading comprehension as a thinking process were considered within the second section. Though research-based evidence for these constructs is generally lacking, there appears to be a consensus of opinion among the majority of writers in the view that reading comprehension is thinking beyond the content of the printed page, and ranges from simple to complex.

Because Bloom's Taxonomy of Educational Objectives forms the basis for many question-classification systems and is the construct upon which the Ohio Scales I used within this study was based, consideration of the validity of its hierarchy was presented in section three, together with a number of question-classification systems based upon the taxonomy. Although only a general kind of support for the hierarchical structure of the taxonomy was noted within the research literature, there is a growing increase in the importance of the taxonomy in devising modified systems for classifying classroom verbal interactions and pupils' thinking.

A survey of questioning practices within teaching is contained within the fourth section of this chapter. Findings of research reveal that teachers generally do not carry out in practice educators' views of the question as a valuable tool for promoting thought processes. Their questions generally are of a low level which do not stimulate





productive thought.

Research literature related to the effects of questioning upon pupils' performance, presented in a following section, provided general positive support for the belief that pupils exposed to higher-level questions tend to achieve more highly than those pupils exposed to questioning activity that involves lower levels of thinking. Questioning however, is a complex interactive process between teachers and pupils which requires both the implementation of a variety of procedural techniques and much practice. Various techniques for soliciting responses, attending to the pupil's response and reacting to the pupil's response were presented in the final section of this chapter.



## Chapter III

### THE EXPERIMENTAL DESIGN

This chapter will describe the design of the study. It will include a description of the student population and sample, the selection and evaluation of elementary reading materials, the test instruments, the treatment procedures and the analysis of the data.

### THE DESIGN OF THE STUDY

The purpose of this study was to investigate the effect of a questioning strategy used in reading discussion sessions, as an aid in developing the thinking of low reading comprehenders in thinking about higher-level questions of analysis, application, synthesis and evaluation. In order to achieve this purpose the study was conducted in three stages. The first stage involved the analysing of elementary reading materials for story selections appropriate for the asking of higher-level thinking questions; the designing of a generalization strategy as a framework from which questions could be designed and the formulating of key questions to be asked. The second stage required that the suitability of the designed questions and the researcher's competency in implementing them be investigated in a pilot study. Also, a pre and post test instrument was devised by the researcher during this second stage and its suitability as an instrument for assessing the effects of the questioning strategy on pupils' thinking investigated in a second pilot study during this stage.



The final and third stage involved the collection and analysis of data. Taped transcriptions of the pre and post tests, administered orally to pupils of the treatment and control groups, together with transcriptions of the daily discussion sessions with the treatment group, controlled and directed by the questioning strategy, provided data for the study. These data were then descriptively analysed in terms of (1) the pre and post test performances and (2) lesson-by-lesson progressions.

Because the study was to extend over a period of approximately one month, and each 45 minute daily discussion session was to be taped and transcribed in total for the treatment group, it was necessary that the study be conducted with one experimental group and one control group only. In order to achieve maximum effectiveness in terms of pupil participation within the group, as recommended by Bass and Norton (1951), and in order to approximate small reading groups frequently conducted within classrooms, the size of the experimental and control groups was limited to eight pupils each.

The treatment group, hereafter referred to as the experimental group, engaged in daily discussions of story selections in which the questioning strategy was implemented by the researcher. The control group received daily instruction in specific integrated language arts skills.

#### THE SAMPLE

The population from which the research sample was chosen involved five classes of fifth-grade pupils from one city school, a





total of 150 students. Because the criteria for sample selection made it difficult to find large numbers of suitable subjects within one classroom, it was necessary to carry out the study in one of the larger city schools. This particular school, assigned the researcher by central office personnel for the school system, was believed to have a large enough population to permit a main study and a second pilot study. From a total population of 150 fifth-graders, 23 suitable subjects, 15 boys and 8 girls, were identified. The selection process for these pupils is described in the following section.

A stratified randomization was used to assign these pupils to an experimental group and a control group of 8 pupils each and a pilot sample of 7 pupils. Using a table of random numbers (Kerlinger, 1973, p. 714) the girls were assigned 3 each to the experimental group and the control group, and 2 to the pilot sample. The 15 boys were randomly assigned, 5 to each of the 3 groups. Hence the experimental group and the control group were made equal by sex. It was decided that a pupil with a word recognition score of 5.6, two months below his grade placement at the time of testing, would be considered a borderline subject for the study and no more than one borderline pupil would be in each group. The two subjects scoring 5.6 were randomly assigned to the control group and the experimental group.

During the last week of the main study one of the pupils had to be dropped from the experimental group because of illness. This reduced the total sample to 15. All pupils within this sample were in the 10-11 year age range.



### Selection of the Sample

The sample of 16 students selected for the main study, and representing the experimental group and the control group combined, was identified by a screening process as low in reading comprehension but high in word accuracy. For the purpose of identifying low reading comprehenders, the Van Wagenen Analytical Reading Scales, Intermediate Division, Form M, was administered to the entire fifth-grade population of 150 pupils. Any pupil receiving a grade score of one year or greater below his present grade level of 5.8 at the time of the test administration, and achieving less than 75 percent in any four of the five phases tested, was classified as a low reading comprehender. This 75 percent comprehension stipulation was based upon the standards that exist among many reading authorities (Wall, 1971; Gallant, 1970; Betts, 1957). In order to avoid the possibility that a pupil's difficulty in comprehension was a factor of his inability to pronounce words, it was necessary that each pupil within the sample be able to pronounce words within their present grade level. Those identified as low reading comprehenders were administered the Schonell Graded Word Reading Test. Since this test is a test of words in isolation it was assumed that a score of 5.6 would be adequate for the pupils' present grade level. On the basis of the work of Emans and Fisher (1967), which supports the hypothesis that the more clues available to the reader the easier it is to unlock unfamiliar or difficult words, it was assumed that reading words in isolation would be a more difficult task for these pupils than reading in context. Hence, their performance when reading story selections might be slightly



higher than when reading word lists. Furthermore, evidence from both pilot studies indicated that pupils rating two to three months below their grade level on the Schonell Graded Word Reading Test had no apparent difficulty in reading the selected stories. It was decided, however, that a score of 5.6 would be considered borderline and the maximum number of pupils obtaining such a score to be placed in the experimental and control groups would be one per group.

To eliminate the possibility of intelligence and language being significant factors of poor comprehension, it was considered essential that each pupil in the study be of average or above intelligence, have adequate language facility and speak English as a first language. Information related to intelligence was gathered from the school records for 1973-74. Those pupils for whom no recent record was available were administered the Canadian Lorge-Thorndike Intelligence Tests, Level C, Form 1, Nonverbal and Verbal Batteries, hereafter referred to as the Lorge-Thorndike Tests. All pupils scoring 92 or above in both the verbal and nonverbal tests were included as possible subjects. This score is the minimum score within the average range as set out in the manual for these tests (Lorge and Thorndike, 1967, p. 27). Pupils were considered to have adequate language facility if they scored average or above on the verbal battery of the Lorge-Thorndike Tests and were described by their classroom teacher as demonstrating adequate competency in both their understanding of statements spoken to them and their use of spoken language. Data related to English as a first language were secured from the school records or supplied by the pupil himself. No pupil was included in





the sample who had a record of emotional problems or learning disability. Records from the pupil's file and the school counsellor provided pertinent information in this respect.

The composition of both the experimental group and the control group may be seen in Tables 3 and 4. A profile for each student showing the percentage of the material understood for each of the five reading phases tested by the Van Wageningen is given in Table 5. These groups were considered comparable groups.

#### TESTING INSTRUMENTS

The following section presents a description of the test instruments used in the study.

##### The Van Wageningen Analytical Reading Scales

An estimate of each pupil's comprehension level was obtained by administering the Van Wageningen Analytical Reading Scales (1966) Intermediate Division - Form M to the entire fifth grade school population of 150 pupils.

This particular test, referred to hereafter as the Van Wageningen, is intended for use with pupils within grades 4 through 6. It is designed to give a measure of student performance in five phases of reading comprehension: central thought, simple details, related ideas, inference making and interpretation. These phases are described within the text as follows:

Central thought — the ability to see what paragraphs are mainly about.



Table 3  
Composition of the Control Group

Pupil	Sex	Van Wagenen Score	Schonell Score	Present Grade	Age	Lorge-Thorndike Scores		
						Verbal	Nonverbal	Full
1	F	3.8	5.8	5.8	10.9	102	106	104
2	F	3.4	6.7	5.8	10.7	101	103	102
3	M	4.0	6.3	5.8	10.8	103	101	102
4	F	4.7	5.6	5.8	10.5	110	115	113
5	M	4.6	6.3	5.8	11.1	102	100	101
6	M	2.7	6.5	5.8	11.2	99	100	100
7	M	4.2	5.8	5.8	11.0	104	106	105
8	M	3.8	5.8	5.8	11.3	102	104	103
Mean		3.9	6.1	5.8	10.9	102.9	104.4	103.8

Table 4  
Composition of the Experimental Group

Pupil	Sex	Van Wagenen Score	Schonell Score	Present Grade	Age	Lorge-Thorndike Scores		
						Verbal	Nonverbal	Full
9	M	4.2	6.5	5.8	10.6	102	104	103
10	M	4.7	6.2	5.8	10.9	102	106	104
11	M	4.0	6.3	5.8	11.2	99	105	102
12	F	4.2	6.3	5.8	11.2	110	113	112
13	M	3.4	6.9	5.8	11.0	104	100	102
14	F	4.8	7.3	5.8	11.1	116	114	115
15	M	2.9	5.8	5.8	11.4	104	110	107
16	F	4.8	5.6	5.8	10.7	104	110	107
Mean		4.1	6.3	5.8	11.0	105.1	107.8	106.5



Table 5

Student Profile Showing Percentage of the Content Understood  
for Each Task of the Van Wageningen Reading Scales

		Central	Simple	Related			
Pupil		Thought	Detail	Ideas	Inference	Interpretation	
Control Group	1	25	40	40	30	30	
	2	25	15	15	15	35	
	3	25	55	15	50	30	
	4	30	55	50	35	15	
	5	50	55	40	55	40	
	6	12	30	12	12	below 7.5	
	7	50	40	35	40	40	
	8	30	35	40	30	25	
Mean		30.8	40.6	30.9	33.4	27.3	Mean 32.6
Experimental Group	9	40	45	20	60	30	
	10	65	55	35	40	50	
	11	45	50	45	15	15	
	12	30	35	60	35	50	
	13	15	25	30	25	15	
	14	60	55	50	50	50	
	15	25	15	below 7.5	35	below 7.5	
	16	45	50	55	50	60	
Mean		40.6	41.3	37.8	38.8	34.7	Mean 38.6





- Simple details      — the ability to notice details stated in a paragraph.
- Related ideas      — the ability to see the more complex ideas expressed in groups of two or more sentences.
- Inferences          — the ability to go beyond the statements in paragraphs in forming inferences.
- Interpretation      — the ability to interpret the context of paragraphs or to see the qualities that characterize the scene, the action or the characters of individuals portrayed in the paragraph.

There are 100 tasks in the total scale with 20 tasks in each of the five phases. The pupil is required to read 23 short paragraphs for the entire test. Following each paragraph is a number of incomplete sentences accompanied by 5 words or phrases with numbers in front of them. The pupil is directed to pick out from the five answers the one that best completes the sentence, and to mark his choice by shading in the corresponding space for the number of his choice on an IBM answer sheet. It is recommended that at least two forty-five minute periods or one long period be allowed for each pupil to complete the 100 tasks. All pupils were able to finish the test within two one-hour periods.

The Van Wagenen provides a total measure of reading comprehension ability together with separate scores for each of the five reading phases. A grade level score may be obtained together with a percentage rating in terms of the percent of the material the pupil understood according to his performance score. Both the grade score



for the total measure of reading comprehension and the percentage of the content understood within each phase was used in this study.

Data relevant to the reliability and validity of the test norms however are not provided within the test manual. Buros (1968) states that such information could not be gotten from the test publishers. Stroud however, in a review of the Dvorak-Van Wagenen Diagnostic Examination of Silent Reading Abilities, of which Part III is published separately as the Van Wagenen Analytical Reading Scales used in this study, offers support for the test (as in Buros, 1968, p. 90). When evaluating Part III he writes: "There is little doubt that the processes suggested by these labels are implicated in effective reading." And "As a general test of reading, Part III deserves a ranking with the best."

The Van Wagenen test was selected by the researcher for the purpose of identifying low comprehenders because it appeared to be the only test available at the elementary level that attempted to get at various levels of thinking. Tests administered by the school were not utilized as a screening device for the study because an analysis of these test items showed that the majority of the items fell within the recall of details or factual information level of thinking. Furthermore, the paragraph composition of the Van Wagenen was considered by the researcher to be more representative in content and format of the stories found in fifth-grade reading materials and of the story selections used in the study. In addition, the breakdown of individual task scores in terms of the percentage of the content understood, allowed the researcher to select those pupils comprehending



less than 75 percent of the content in each of the five phases.

The smaller print of the Van Wagenen may have affected pupil performance. Since pupils were accustomed to using computer scored answer sheets for the school administered reading tests in grades 3 and 4, the use of separate answer sheets for the Van Wagenen was not considered to have any adverse effect however. All answers were hand scored by the researcher using scoring keys.

#### The Schonell Graded Word Reading Test

In order to eliminate from the study those pupils whose low comprehension scores were related to their inability to pronounce words, The Schonell Graded Word Reading Test was administered all students identified as low reading comprehenders. This test, referred to hereafter as The Schonell, consists of one hundred words of increasing difficulty in word identification from first grade to high school which the pupil is asked to read orally. The test results, expressed in either a reading age or a grade level, provide an estimate of a pupil's present level of recognizing words in isolation. The test was administered to all subjects according to the prescribed procedures (Schonell and Schonell, 1950). A grade score of 5.6 was considered adequate, though borderline, for the study. All pupils scoring below this level were eliminated as possible subjects.

Although no reliability of the scoring for The Schonell is available, it is a reputable test that is used widely as a diagnostic instrument both clinically and in research, as well as within many school systems for the purpose of identifying pupils who have difficulty in pronouncing words. A description of the test can be found





in Buros' (1968, p. 237) book of tests and reviews.

### The Canadian Lorge-Thorndike Intelligence Tests

The Lorge-Thorndike Intelligence Tests are a series of tests designed to measure a pupil's abstract intelligence, i.e. the pupil's "ability to work with ideas and relationships among ideas" (Lorge, Thorndike and Hagen, 1967, p. 3). The Canadian multi-level edition is an adaptation of the Lorge-Thorndike Intelligence Tests and provides both a Verbal and a Nonverbal Battery for grades 3-9, Levels A-F, in a single, reusable booklet. Separate sets of items for both batteries are provided for each grade. Responses are recorded on IBM computer sheets.

The Verbal Battery is made up of five subtests using verbal items only: vocabulary, verbal classification, sentence completion, arithmetic reasoning and verbal analogy. The Nonverbal Battery uses pictorial and numerical items only. It is comprised of three subtests involving picture classification, pictorial analogy and numerical relationships. Items on both batteries generally deal with symbolic relationships, and in answering the questions the pupil is required to discover a principle and then apply it. Level C of Form I, designated for assessing fifth grade pupils, was used for this study. Three scores are obtainable from these tests: a verbal intelligence quotient, a nonverbal intelligence quotient, and a composite or full intelligence quotient. In addition norms are provided for grade percentiles and equivalencies, and age equivalencies. This study was concerned with intelligence quotients only.

Though the validation of these tests for the Canadian sample



is still in the process of being established, similar forms of the tests used in the United States indicate that the tests correlate in the high 70's and 80's with other well known measures of intelligence, i.e. the Stanford-Binet Intelligence Scale and the Wechsler Intelligence Scale for Children, Verbal Scale. Odd-even reliability data for the Canadian Lorge-Thorndike Intelligence Tests, based on representative single-grade samples from the standarization program for the Form 1, Level C showed a correlation of .659 between the verbal and nonverbal batteries.

#### The Research Instrument

A research instrument was needed to provide a measure of pupil thinking before and after the treatment period. For this purpose pre and post tests were designed by the researcher. The construction of these tests is fully described in the following chapter. Hence only a brief description will be given below.

Two story selections, "Child of the Silent Night" and "How Helen Keller Learned" were chosen as comparable stories from reading-language texts written for the elementary grades. The story "How Helen Keller Learned" was used in the pretest and "Child of the Silent Night" in the posttest. A generalization strategy that was appropriate for both stories was designed as a map or guide for writing questions. From this generalization strategy, sixteen questions were written for each story, varying from simple recall to evaluation, and emphasizing the higher levels of thinking. Each of the questions for both stories was identical in wording except where changes were necessary for differences in proper names and



situations within the story. Each story, together with the generalization strategy and the set of prepared questions for the pre and post tests can be found in Appendices C through H.

The pre and post tests were oral tests individually administered by the researcher to each pupil in the sample. The story selection for the test was first read silently by the pupil, following which he was asked the set of prepared questions by the researcher. The researcher allowed each pupil as much time to answer each question as he needed. Administration of the test took from 40 to 50 minutes per pupil. The entire testing session for each pupil was taped and later transcribed.

The pretest was administered during a three day period prior to the beginning of the treatment sessions. The posttest was administered over a three day period following the completion of the treatment.

This particular form of a pre and post test was used because it was believed to be consistent with the oral questions used in the treatment discussions. Gall (1970) questions the validity of using a pre and post test instrument that is not consistent with the treatment. In discussing Hunkins' (1966) research in questioning, he points out as a weakness in the study, Hunkins' use of a multiple-choice pre and post test which is unlike the treatment technique. He states ". . . one may question whether the achievement test provided an adequate comparison of the effectiveness of the two experimental conditions" (p. 714). While the researcher of this study was not attempting to get an achievement measure in terms of a score, she





considered it necessary that the method of obtaining a measure of pupils' thinking before and after the treatment period should be as similar as possible to that used in the actual treatment sessions.

### The Ohio Scales

The scales used within this study for classifying teacher's questions and statements and pupils' responses were a modified form of the scales developed in the 1967 Ohio State University study conducted by Wolf et al. They have been entitled the Ohio Scales by Davidson (1970) and this title is retained within this study.

This instrument is a two dimensional construct that allows for the recording of teacher's questions and corresponding pupil responses according to categories. The categories for classifying the teacher's verbal behavior as designed by Wolf et al. were based heavily on Bloom's (1956) Taxonomy. The categories for classifying pupil responses were designed from Guilford's (1956) construct of the intellect. Category descriptions and a diagrammatical representation of the two dimensions of the Ohio Scales are presented in Appendices L and M.

The Ohio Scales provides a system for classing teachers' verbal behavior in seven categories: Gathering Specific Facts, Clarifying, Interpreting and Inferring, Analyzing, Applying, Summarizing and Concluding, and Evaluating. Slight changes were made in the rewording of these titles to Gathering Specific Facts, Clarification, Interpretation and Inference, Analysis, Application, Synthesis and Evaluation. It was necessary to make certain changes in the wording of the Wolf et al. category description for Evaluation and Analysis since these



categories had been defined for the teaching of specific skills. The Synthesis category description however, required rewriting. Sanders (1966) and Bloom (1956) were utilized in the rewriting of this category. For the purpose of clarification, the modified scales utilized within this study for classifying teachers' statements and questions are referred to as the Ohio Scales I. The categories are described as follows:

Gathering Specific Facts. All teacher talk that is intended to bring information to the attention of the group is recorded as gathering specific facts. It includes fact stating, reporting information from books and authorities, getting the main idea, reading from a book, or requesting information from pupils.

Clarification. A clarifying statement or question is one used to refine previously discussed ideas or those misinterpreted by members of the group. It includes defining, clarifying a concept through an illustration, emphasizing a prior point, rephrasing, or making the meaning clear. Parroting statements are ignored unless an idea is expanded.

Interpretation and Inference. An interpreting or inferring statement or question is one which goes beyond the literal meaning. It includes interpreting figurative language, inferring beyond the literal message, translating information into more comprehensible language, and extrapolating beyond the available data.

Application. An applying statement or question is one in which the teacher makes or asks a student to make some direct application of information or criteria related to the lesson. It includes



applying information to illustrate a point, applying criteria to be used in evaluation, and illustrating a generalization or a principle in a specific instance.

Analysis. An analyzing statement or question is intended to separate or distinguish component parts of a situation, circumstance, relationship or personality. It includes examining the nature and relationship of the parts and searching for the organizational pattern or principles.

Synthesis. A synthesizing statement or question requires imagination and original thinking in presenting information in an original structure. It is used to put together elements or parts in a unified whole. Relationships between the parts or elements may be shown.

Evaluation. An evaluative statement or question is one in which a judgment is made based upon established criteria. An evaluating question is one which elicits a decided judgment based upon established criteria. A child may use his own set of personal values as the set of criteria or use criteria established by the group.

Pupil responses are classified according to the Ohio Scales in five categories or sequential levels. These categories are as follows: Level 1: Random Responses; Level 2: Non-critical-Literal; Level 3: Giving Illustrations, Applying and Interpreting; Level 4: Imagining, Hypothesizing, Theorizing; and Level 5: Critical Thinking: Evaluation, Judging, Using Criteria. For the purpose of this study slight changes were made in the Level 2 category in which the word





"Non-critical" was omitted. Level 5 was titled simply Evaluation, with the term critical deleted. The terms critical and non-critical were necessary for the Wolf et al. study but were not considered essential for the present study. Parts of sentences within the category descriptions which did not apply to this study as they did in the Wolf et al. study were deleted. This occurred with the Level 1 and Level 2 category descriptions. A sentence part was added to the Level 4 category description however in order to facilitate the classification of responses to analysis and synthesis questions. As in the case of the evaluation category for classifying teachers' verbal behavior, the category description was adapted to suit the needs of this study. The modified version of the Ohio Scales for classifying pupil responses as used in the present study is referred to as the Ohio Scales II for clarification purposes. Each level is described as follows:

Level 1: Random Response. When there is unsupported guessing in response to a teacher's comment or question, a number is recorded in this column. If a child says "I don't know," it is recorded here. "I like," "I don't like" statements are considered random responses.

Level 2: Literal. Literal responses are those which can be directly drawn from the material in the lesson. They will include factual answers, literal comprehension, reporting verbatim, and repeating previously agreed upon material.

Level 3: Giving Illustrations, Applying, Interpreting. Responses in which children give illustrations, interpret material, or apply



information are recorded at Level 3. These responses are frequently those in which a child gives an example from his own life which exemplifies the point under discussion.

Level 4: Imagining, Hypothesizing, Theorizing. Pupil responses which go beyond the information available to the group are recorded in this category. They include going beyond the data, extrapolating, or diverging from the material before the group and giving evidence of an awareness of the relationship between component parts when extrapolating or diverging from the material.

Level 5: Evaluating. Responses recorded at Level 5 are ones in which students go beyond the literal meaning of printed matter and use data from the printed material in an evaluative decision. Evaluative responses are statements in which the pupil has obviously established definite criteria and has evaluated on the basis of the criteria.

#### SELECTION AND ANALYSIS OF STORIES

Most of the existing literature on the application of questioning strategies to reading materials is related to social studies content (Hunkins, 1972; Taba, 1967; Sanders, 1966). No literature could be found by the researcher however, on the actual application of a specific questioning strategy such as Taba and Hunkins suggest, to specific stories found in either basal readers or various language-arts reading series in use within school systems. Since reading and questioning sessions using these materials comprise a daily 50-60 minute period of the classroom activity at the elementary level, it



seemed necessary that this particular study should utilize these materials. Hence, the various story selections used in this study were chosen from basal readers and language-arts reading series.

In order to select suitable stories to which a designed questioning strategy could be applied, it was necessary to first carry out an investigation of the story content in both basal readers and language-arts series at the elementary level. Many stories within a large number of books were observed to be of a content not suitable for the posing of higher-level questions. Furthermore, the content was frequently viewed by the researcher as not realistic to real life experiences of the pupils. It should be noted however, that a number of good selections were found that were not suitable for the study because of their considerable length which extended into 25 or 30 pages. Furthermore, there was evidence of superior story quality in some of the more recently published reading-language texts. The researcher admits however that the survey was a very subjective appraisal of the story content.

Although fifteen stories were selected and designed for this research study, only nine of these were actually used. These stories and the method used in selecting them as suitable for the study is described below.

#### Pre and Post Test Selections

For the purpose of constructing a pre and post test two stories were selected as comparable stories. "How Helen Keller Learned" was selected from What Joy Awaits You published by the Open Court Publishing Company as part of a multi-level reading series for the





intermediate grades. "Child of the Silent Night" was taken from The World of Language, Book 4, published by McGraw-Hill Ryerson Limited as part of a language-arts series also for the intermediate grades. This particular story was adapted by the researcher to obtain similarity in content and length with the story "How Helen Keller Learned." Adapting the selection involved only the omitting of various paragraphs and sentences.

The comparability of these stories was judged by three graduate students in the reading field who were experienced teachers of the elementary grades. It was agreed by the judges that both stories were (1) of similar content; (2) at approximately the same readability level; (3) approximately the same in length; and (4) related to an experience which fifth-graders were able to understand in terms of direct or indirect experiences, and therefore were considered comparable. While the readability levels of these stories were judged by applying the Dale-Chall formula for readability, evaluation of the story content and its relatedness to pupil experience were of a more subjective nature based upon the judge's teaching experience. The story length was judged by the number of pages occurring in both.

Although the stories differ in the sense that "How Helen Keller Learned" is a personal account of how an individual adapted to a handicap, while "Child of the Silent Night" is a biographical account lacking the personal element, this may be considered as only a superficial difference. Flesh (1948) makes no discrimination between the personal pronouns 'I' and 'they,' 'he' and 'she,' for



example, in revising his readability formula for measuring reading difficulty. He considers the human element a factor of reading ease because of its effect upon interest. Therefore special consideration is given to all proper nouns and pronouns with no discretion being made between kinds of pronouns. One might assume then, that he considers personal pronouns to have no significantly greater effect on the comprehension of a story or passage than other human nouns and pronouns. Considering then that the stories were evaluated as comparable in the four specific aspects already mentioned, and that both stories include an account of the interaction processes that went on between individuals during the early stages of adapting to the same handicap, they were accepted for this study as comparable stories.

The suitability of these stories for the research study was also judged in the same manner as all other story selections used in the treatment sessions. This method is described in the following section.

#### Selection and Evaluation of the Treatment Stories

Criteria for selecting all stories to be used in the research study were devised by the researcher. These criteria, established as a result of reading relevant literature on the selection of classroom reading materials (Wood, 1976; Durkin, 1974; Botel and Granowsky, 1973) and in consultation with fellow graduate students, included the following stipulations:

1. Each selection must fall within the readability level of grade 4-6.



2. The content must be such as to support higher-level thinking in terms of (a) having the potential for asking higher-level questions and (b) being able to be adapted to a generalization strategy.

3. The content should have a high interest potential for fifth-grade pupils.

4. The vocabulary level must be at a level appropriate for grade five.

5. Ideas and concepts presented in the story should not be of a nature too complex for a fifth-grader, i.e. beyond his realm of experiences, either direct or indirect, but novel enough to stimulate thinking.

6. The syntactic structures of sentences within the story should be of a complexity believed to be that which students can handle.

7. Attitudes and ideas fostered by the story should not be of a controversial nature, that is, they should not support particular ethical, racist or religious views.

The readability level of each story selection was established by the researcher using the Dale-Chall Readability Formula. This formula was chosen on the basis of Klare's (1968) assessments of its validity. He suggests, from studying a number of comparative studies, that the Dale-Chall formula is the most accurate formula "since it is consistently more accurate than others in comparisons; though sometimes only slightly so" (p. 22). The formula was applied to three 100 word samples in each story to obtain a grade level rating for the story.





The rating for the nine stories used in the study is shown in Table 6.

A generalization strategy for each story was then designed by the researcher. Each selection, together with its designed generalization strategy and a story and generalization evaluation sheet was then given to three of five evaluators, all of whom had experience in teaching reading at elementary levels and were engaged in graduate studies in reading. The judges were asked to evaluate the appropriateness of the generalization and the suitability of the content according to the established criteria. The teacher evaluation sheets for both the generalization strategies and the story content are contained in Appendices A and B.

All suggestions or comments of a controversial nature given by any evaluator were afterwards discussed by the researcher with the particular evaluator. Whenever the researcher felt it was necessary or beneficial to do so, changes were made in the generalization strategy to include these views or suggestions. These changes were then discussed with the other evaluators and agreed upon. Since no controversial issue arose from the story content evaluations, no selections were deleted. A point relating to vocabulary however was made by the evaluators. While the stories were judged to have a vocabulary content within the fifth-grader's level of understanding, a number of unfamiliar words which teaching experience would identify as unfamiliar to many fifth grade pupils, were noted in certain stories. Since these words were considered by the researcher and judges unlikely to affect the general comprehension of the story itself, and related more to specific details of a particular sentence,



Table 6  
Readability Levels of the Story Selections According to the  
Dale-Chall Readability Formula

Story	Readability of Sample 1	Readability of Sample 2	Readability of Sample 3	Average of 3 Samples	Grade Score
How Helen Keller Learned	5.2	6.0	5.4	5.6	5-6
Child of the Silent Night	4.9	5.1	5.5	5.2	5-6
The Last Day of September	5.4	4.6	4.4	4.8	4th & below
Joaby	5.1	4.7	5.3	5.1	5-6
Get It Right on Paper	4.9	5.1	4.2	4.8	4th & below
Gulliver the Great	5.4	5.2	6.1	5.6	5-6
The Hundred Dresses	4.9	6.4	4.8	5.4	5-6
The Real Ugly Duckling	5.3	5.8	4.6	5.3	5-6
Larry Charts a Course	4.6	6.3	5.7	5.6	5-6



they were not seen as adversely affecting the pupil's comprehension. It was agreed that allowing the pupil to ask the meaning of any word he did not understand would provide for any difficulty these words might cause. Consequently the instructions for conducting the question-discussion sessions were altered to include this provision.

A complete list of the stories used for small-group question-discussion periods, together with the source of each story is presented in Table 7.

Table 7  
Story Selections for Discussion, Their Sources and Book Level

Series	Book Level	Story Title
Gage: Comprehension Strategies 1	4-6	The Last Day of September
Gage: People Like Me	4-6	Get It Right on Paper
Gage: Comprehension Strategies 2	4-6	Joaby
Gage: Comprehension Strategies 2	4-6	Larry Charts a Course
Ginn: Reading 360—The Sun That Warms	Level 11 (Gr. 5)	The Real Ugly Duckling
Mifflin Readers: Bright Peaks	Grade 5	Gulliver the Great
Reading Caravan: Silver Web	Grade 5	The Hundred Dresses

TREATMENT PROCEDURE FOR THE STUDY

During the period of May 7 to June 6, 1975, the researcher conducted daily 45 minute small-group discussion sessions with an experimental group and a control group of 8 fifth-graders each. A total of 20 sessions was held with each group. The general instructions used at the beginning of these sessions may be found in Appendices I and J.





Details of the specific activity which was conducted in both groups are described in the following sections.

#### Experimental Group Sessions

During the 20 sessions conducted with the experimental group, a specific questioning strategy, designed for this study, was implemented in discussing seven selected stories. These stories have been discussed in the previous section. The questioning strategy, evolving from a generalization strategy and described in complete detail in Chapter IV, consisted basically of posing a number of prepared higher-level key questions throughout the session. Questions however, could not be formed in detail or in any hard and fast fashion since a pupil's response decided the order in which the questions would be asked, and the specific questions that would follow the asking of a key question. The completion of a strategy of questions required from two to four sessions, depending upon the story length and content. Each discussion period was taped and a transcription of the entire tape was made before the next day's session.

For the first two weeks of the study the experimental group met with the researcher from 9:15-10:00 a.m. Because difficulties arose in rescheduling these pupils' physical education periods, a time change was necessitated. For the remainder of the study the group sessions were held from 1:15-2:00 p.m. daily.

#### Specific Procedural Techniques of the Experimental Group Sessions

In order to ensure the involvement of all pupils and to encourage pupils to think as well as they could during the discussion



session, a number of specific techniques and regulations were implemented during the discussions.

1. The initial discussion of a new story selection involved first speculating about the story using only the story title. The purpose of this approach was to first involve pupils in a particular way. It was to create a purpose for reading as Stauffer suggests and so motivate or set pupils for productive reading (Stauffer, 1969).

2. Each session following the introductory session began with a 5-10 minute review period. This included first skimming the story or part that had been read the previous day for the general content. Then a summary of the previous day's questions and responses, made from the tape transcription, was given by the researcher. This summary was limited to the specific key questions asked and the exact related responses that were given.

3. As many questions as possible were open-ended requiring more than one response and thus involving more than one pupil in answering.

4. Wherever possible questions were redirected from pupil to pupil to obtain greater pupil participation.

5. Whenever a key question from the question strategy was posed which changed the focus of the discussion, a period of 3-5 seconds or greater elapsed before any response was expected from a pupil. This was to encourage all pupils to think about the question.

#### Control Group Sessions

The control group, who met with the researcher from 11:00 to 11:45 a.m. daily for 20 lesson periods, received instruction in



integrated language-arts skills. The focus of the lessons for this group was upon the semantic structure of sentences and paragraphs, together with the actual writing of paragraphs and studying of short expository selections. Lessons extended from a study of the relatedness between words and phrases within complex sentences to the relationship of sentences within a paragraph and the interrelatedness of paragraphs in expository selections. Application of this skill was extended in written practice.

The purpose of these sessions was to help pupils organize what they were reading, and through understanding the relatedness between sentences and paragraphs, to remember the content of a selection in a more concise form. It was also hoped that the pupils might utilize this skill in writing expository paragraphs and short stories within the classroom.

The unit of study for the control group was designed by the researcher and illustrative lesson samples can be found in Appendix R.

Each of the 20 sessions was taped to control for the taping variable influencing the experimental group. No transcriptions were made from these tapes however. During the sessions no deliberate attempt was made to control the kinds of questions being asked since the focus of the lessons was on sentence and paragraph structure. All questions asked during any lesson period related to identifying structures within a sentence, identifying relationships between sentences, or the construction of such relationships during written practice. Certain questions were necessarily at the application, analysis and synthesis levels but these questions related only to the





direct use of the specific skill in reading and writing practices.

Examples of such questions would be:

1. How do these three sentences relate to the first sentence in the paragraph? (Analysis-Synthesis)
2. Outline this paragraph to show how it is organized. (Analysis-Synthesis)
3. How are these two paragraphs related? (Analysis-Synthesis)
4. What is this paragraph about? (Analysis)
5. Write a short paragraph of four sentences, beginning with the following sentence. (Synthesis)

The use of this particular unit with the control group was decided upon as an alternative to the researcher's initial plan. It had been planned to discuss with the classroom teachers various weaknesses these pupils were experiencing in specific reading or language skills and to devote the sessions to individualized instruction in these areas. Because the pupils were streamed for reading classes and certain language exercises, and most of them moved to a teacher other than their classroom teacher, it became very difficult to get an accurate assessment of the pupil's performance. The classroom teachers generally indicated they did not know exactly what the particular pupil did in reading because he went to another teacher for instruction. The reading teacher on the other hand could speak only very generally in terms of what program or materials were being used with the pupils. There was no clear, concise diagnosis of a particular weakness the particular pupil was experiencing. Consequently the researcher designed a unit of studies which she considered



beneficial for these students in organizing and understanding expository selections such as those appearing in certain science or social studies texts. It became obvious during the tutoring sessions that these pupils were extremely weak in understanding and writing complex sentences, and particularly in noting relationships between sentences and paragraphs. In addition, they had little or no skill in organizing and relating sentences in written paragraphs. Therefore it was assumed that the exercise would be beneficial for them.

#### ANALYSIS OF THE DATA

Data for analysis were obtained from transcribed tape recordings of the oral pre and post tests administered pupils of the control and experimental groups, and the transcribed recordings of five selected story discussion sessions conducted with the experimental group. These data were not subjected to rigid statistical analysis but were descriptively analysed in terms of the pre and post test performance of both the control and experimental groups, and the lesson-by-lesson progress made by the experimental group in the story discussion. All responses of the pre and post tests were categorized by the researcher within Levels 1 to 5 of the Ohio Scales II, and 15 percent of the total classified responses to higher level questions checked for rater agreement. All teacher questions and statements and all pupil responses resulting from the five selected story discussions were categorized in a similar manner using the Ohio Scales I for the classification of the teacher's questions and the Ohio Scales II for the classification of pupil responses. No rater agreement was



undertaken to determine the accuracy of the researcher's ratings for the discussion verbalizations however, due to difficulty encountered in finding evaluators during the summer vacation. Because the rater agreement for the classification of the pre and post test responses was 96 percent, the researcher believed the ratings assigned responses of the discussions were accurate.

In addition to analysing pupil responses according to levels as indicated by the Ohio Scales II, all Level 3, 4 and 5 responses of the pre and post tests and of the five discussion sessions to higher-level questions were further classified according to the level-of-complexity within the response. Responses were further judged for the appropriateness of the response to the question asked. Systems devised by the researcher were utilized for these aspects (Chapter IV).

For the purpose of determining the independent progress made by pupils during the discussions it became necessary to identify assisted and unassisted responses in the lesson transcripts. This involved identifying functional techniques of raising, lowering or expanding the level of questioning employed by the teacher.

Having thus categorized all questions and responses, the pre and post test data, and the lesson-transcript data, were subjected to further analysis. The pre and post test data were analysed for the following aspects:

(a) The levels at which pupils responded to the higher-level questions of analysis, application and evaluation.

(b) The instances of pupils progressing from a lower level of





thinking to a higher level of thinking on corresponding questions of the pre and post tests.

(c) The instances of pupils progressing in the degree-of-complexity of responses on the posttest when the pre and post test responses remained within the same level.

Within and between group comparisons were made of findings related to these aspects to determine the effectiveness of the questioning strategy implemented in the study.

Data obtained from the application of the various classification systems previously mentioned to the lesson transcripts were further analysed for the following aspects:

(a) the frequency of pupil and teacher participation

(b) the frequency of pupil responses to their peers and to the teacher

(c) the frequency and kinds of questions asked by pupils.

Data relevant to each of these aspects were recorded and studied to obtain information related to the effect of the questioning strategy upon pupil participation.

The final stage of the analysis of the lesson-transcript data attempted to determine the effectiveness of the questioning strategy over time in producing changes in pupil behaviors. The lesson-transcript data were further analysed in terms of the following features:

(a) the frequency of Level 3, 4 and 5 responses to higher-level questions within each lesson

(b) the frequency of unassisted and assisted Level 3, 4 and 5



responses to higher-level questions within each lesson

(c) the frequency of questions raised by pupils within each lesson

(d) the frequency of pupils responding to their peers within each lesson.

A series of lesson-by-lesson comparisons were conducted with respect to these features to determine pupil progress during the treatment period.

#### SUMMARY

The sample for this study involved 16 grade five pupils randomly selected from five classes of fifth graders within one city school. A stratified randomization was used in assigning these pupils, identified as low reading comprehenders, eight to each of an experimental group and a control group. The experimental group however, was reduced to seven pupils during the last week of the study.

The research study was conducted over a one month period and investigated the use of a questioning strategy in assisting low reading comprehenders to develop thinking related to analysis, synthesis and evaluation questions. For the purpose of this study a generalization strategy and a questioning strategy was designed by the researcher, together with a pre and a post test. The experimental group engaged in questioning-discussion sessions for a total of 20 periods. During each discussion period a specific questioning strategy was implemented. Materials for the discussion consisted of



story selections from basal readers and language-arts reading series. The control group was instructed in a specific reading-related skill for an equal number of periods as the experimental group. All sessions for both groups were taped. Only the tapes of the experimental group sessions were transcribed for analysis purposes, however. Prior to the treatment sessions the pretest was administered individually to pupils of both groups. The posttest was administered immediately after the treatment period. The testing session was taped for each pupil and later transcribed. Hence a measure of performance before and after the treatment session was obtained.

All transcribed responses of the pre and post test responses were classified according to levels using the Ohio Scales II. These responses were further classified according to the degree of complexity within the response and the appropriateness of the response to the question asked using scales devised by the researcher. All transcribed teacher's questions and pupil responses within five selected lesson discussions were classified in a similar manner, using the Ohio Scales I for classifying teacher questions and the Ohio Scales II for classifying pupil responses. In addition, functioning techniques employed by the researcher during the discussion sessions were identified. Frequencies of responses occurring within each level, together with the frequencies of inappropriate responses were recorded for both the pre and post tests and the lesson discussions. Within and between group comparisons were made of the pre and post test performances, as well as lesson-by-lesson comparisons of pupil performance to assess pupil progress during the treatment period. Analysis was also made of





how the higher-level questions were generally answered by pupils of both groups. The lesson transcripts were further analysed in terms of pupil and teacher participation and the questioning activity of pupils. Results of these analyses were recorded in table form and described.



## Chapter IV

### CONSTRUCTION OF THE RESEARCH INSTRUMENT

This chapter will identify sources of background information related to the formation of the generalization and questioning strategies used in the study. Taba's (1967) content and cognitive map process and question functions, and Hunkins (1972) questioning strategies will be discussed as sources from which ideas were gathered for designing the actual strategies used. An explanation of how the generalization strategies were designed from each story as a framework from which to write key questions of the questioning strategy will be given. How these strategies were evaluated will be discussed together with an explanation of how the pre and post tests were devised and evaluated. The pilot studies will also be discussed.

### BACKGROUND TO THE DESIGNING OF THE QUESTIONING STRATEGY

In reviewing the questioning practices of teachers over more than half a century, Gall (1970) concluded that the emphasis of teachers' questions has been upon factual knowledge. While admitting that knowledge is essential for answering 'thought questions,' he recommended that class time be spent developing pupils' thinking through discussion. When one searches through the increasing volume of literature on teachers' questions for a specific perspective measure in how to apply suggested techniques in discussion periods, however, such advice is rare. Hence, the researcher must become



eclectic, selecting from designs and recommendations of those writing on relevant aspects of questioning, suggestions and ideas that appear pertinent to his intentions, and by using his creative abilities, integrate these in a design suitable for his needs. Such was the case for the present study.

The most influencing literature affecting the designing of generalization and question strategies for this research study was Taba's generic teaching strategies (Taba, 1967, p. 65ff.). Hunkins' concept of a question strategy consisting of questions arranged sequentially according to the levels of Bloom's Taxonomy was also a source of input into the question strategy constructed for the study (Hunkins, 1972).

Taba's content and cognitive map process and question functions are discussed below. A discussion of Hunkins' question strategy continues in a following section.

#### Taba's Content and Cognitive Map Process and Question Functions

According to Taba a generic teaching strategy includes "selection of content, organization of content, planning sequences for learning activities, and adapting the sequences of learning activities to class needs" (Taba, 1967, p. 60). Her theory of generic teaching strategies is applied to social studies content which, selected from various social science disciplines, is organized to assure maximum learning. Mapping is an integral part of the teaching strategies.

For the purpose of providing direction in teaching, Taba



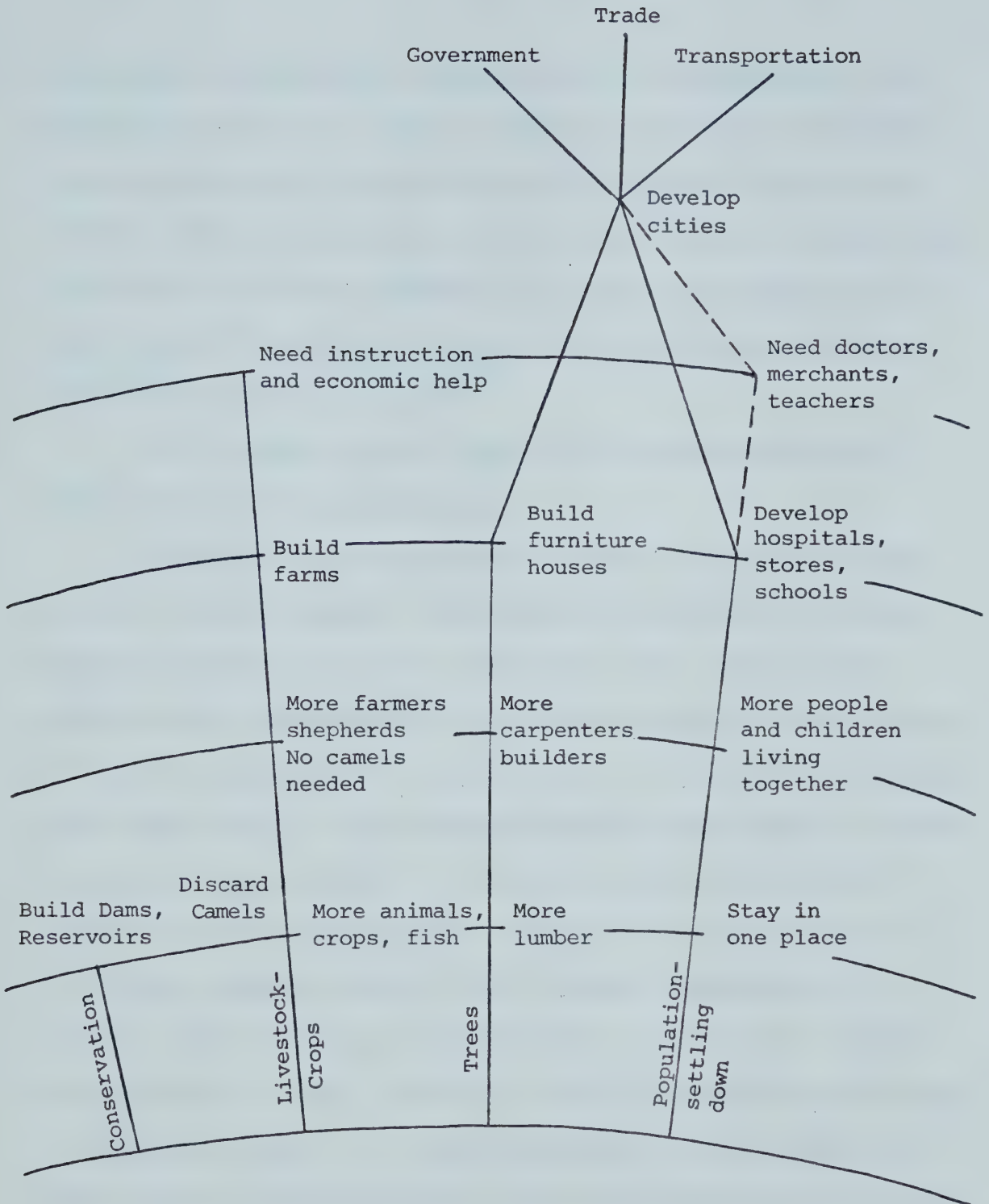


suggests two kinds of maps. A content map indicates the content samples to be used, and the main ideas to be developed in a unit of studies. A cognitive map indicates "the structure and sequence of cognitive processes involved in the various learning tasks" (Taba, 1967, p. 63). The form of the cognitive map however can vary from notes of points to be emphasized and sequential steps within a strategy, to diagrams of probable outcomes or end-products. The diagram as presented in Figure 1 is a cognitive map she suggests for the discussion of a particular question in social studies (p. 65).

The vertical lines on this map represent the divergent lines of hypothesis that pupils may project in a discussion. The horizontal lines suggest the levels of predictions that might occur triggered by the responses of other pupils. These lines can represent either levels of cognitive thought or levels of abstraction. In essence the cognitive map suggests certain directions and levels of ideas that might be developed in a discussion.

Taba included in her teaching strategies three general types of discussions—free, semi-controlled and controlled. Free discussions require little direction except for the initial focusing, and involve simple recall and retrieval of data. Such discussions, she points out, might be used to open a new topic. All pupil responses are accepted as given except for the occasional clarification of a response or point. Semi-controlled discussions are used for the purpose of exchanging information after a period of intake involving either reading, a class visit or an exploration of something. The focus is to integrate the information and may require the teacher to





Note: The vertical lines describe the divergent lines of predictions. The horizontal lines describe the levels of "leaps" in these predictions.

Source: H. Taba, Teachers' Handbbok for Elementary Social Studies. Massachusetts: Addison-Wesley, 1967, p. 65

Figure 1

Cognitive Map of Content in Third-Grade Discussion  
 Question: What Would Happen to the Way of Life in the Desert  
 if Sufficient Water Became Available?



organize the information in a summary form on the blackboard. Controlled discussions are "those in which the cognitive processes are directed by carefully planned sequences of questions" (Taba, 1967, p. 78). Students are required to process data as well as supply them. The general aim of these sessions is to help students advance to higher levels of thinking and the key feature of these sessions is the teacher's questions (p. 88).

For the purpose of the present study Taba's controlled discussion concept was implemented.

According to Taba questioning involves not only the posing of chief focusing questions or key questions which serve to control the main flow and pacing of the discussion, but a series of other questions which depend upon how the students respond. Some responses may require classification or specification. Others may need extension into greater detail. This sequence of questions may serve as a variety of purposes. These include: (1) focusing pupils' thinking in a specific direction; (2) extending thinking at the same level; or (3) lifting thought to another level. However, Taba writes, "It would be useless to preplan these questions, except to be ready with possibilities" (p. 119). In order to ask the appropriate question at the appropriate time "it is equally important to keep on assessing what a student's remarks mean not just in terms of their content, but also in terms of the nature of the thought processes" (p. 119). This however Taba admits is a difficult art. The researcher concurs with her judgement.

Taba does not speak of questioning strategies as such. She





concentrates upon the function of questions and discusses these functions, i.e. focusing, extending and lifting thinking, in terms of developing three cognitive tasks: Concept Formation, Interpretation, and Application of Principles. She does not identify cognitive stages of questions as identified within this present study, however.

#### Application to the Strategy Designs of the Study

The researcher found it very difficult to incorporate Taba's 'cognitive map' idea into the generalization strategies. While Taba has beautifully outlined the application of the cognitive map concept for particular questions in social studies, applying these same general ideas to the content of story selections found in basal readers and language-arts materials for fifth-graders, posed a problem. At the onset it became obvious to the researcher that the content of social studies is far more adaptable to mapping in terms of 'divergent lines of predictions' than a story content. Because one works from a concept base and can diverge to many related materials and in many related directions to develop that concept in social studies, the mapping becomes relatively easy. In dealing with a particular story that is to be discussed however, particularly in the setting of this study, one is automatically limited by the specifics of the story itself. Hence there is a more extensive limitation on the 'divergent lines of predictions.' Although the cognitive map process could not be implemented in its entirety, it served as a stimulus for devising the generalization strategy. Whereas Taba used a key question as a 'spring board' from which to make predictions,



the researcher recognized that a statement or generalization might also have been used. It was then conceived by the researcher that an alternative approach might be to use a mapping design for a series of generalizations which would serve as a 'cognitive map' in providing direction in questioning. The generalizations however would be limited by the story content, and therefore could not have vertical lines of predictions in this study. The generalizations could be expressed horizontally as Taba indicated but would be arranged in a vertical sequence that showed levels of abstraction in a similar sense as Taba's levels of predictions. These levels of abstraction are demonstrated in Figure 2 in which the generalization strategy for the story "Joaby" (Gage, 1973, 40ff) is arranged in sequence. Generalization 1 is the base generalization from which #2 is developed. Generalization #3 stems from #2 and so on, throughout the strategy. In this way, each generalization is considered conceptually higher than the previous generalization from which it springs. Hence, each is considered a higher level of abstraction. Thus, a generalization strategy was constructed in the form of a cognitive map, some of the basic thinking of which must be accredited to Taba.

Credit must also be given Taba for the concept of a 'controlled discussion,' as well as for the focusing, extending and lifting functions that questions served during the discussion periods.

#### Hunkins' Questioning Strategy

Questions, according to Hunkins (1972), do not exist in isolation but within a scheme, and within that scheme they serve four



The decision may or may not be one we feel comfortable about.

7.

Decisions have to be made regarding (1) others, (2) ourselves, (3) our new friend in these uncomfortable situations.

6.

Any change in the relationship may cause anxieties, strain and uncomfortable feelings.

5.

A change in circumstances may result in a change in that relationship.

e.g. returning to the original circumstances

4.

A close relationship can develop for a period of time.

with or without approval of others e.g. parents.

3.

New circumstances can create a need for new friends.

2.

We all have a basic need for friendship.

1.

Theme: New Friendships

Note: Each level represents a higher conceptualization than the previous one.

Story source: "Joaby" Comprehensive Strategies 2, Gage, 1973, pp. 40-45.

Figure 2

Strategy of Generalizations for the Story "Joaby."

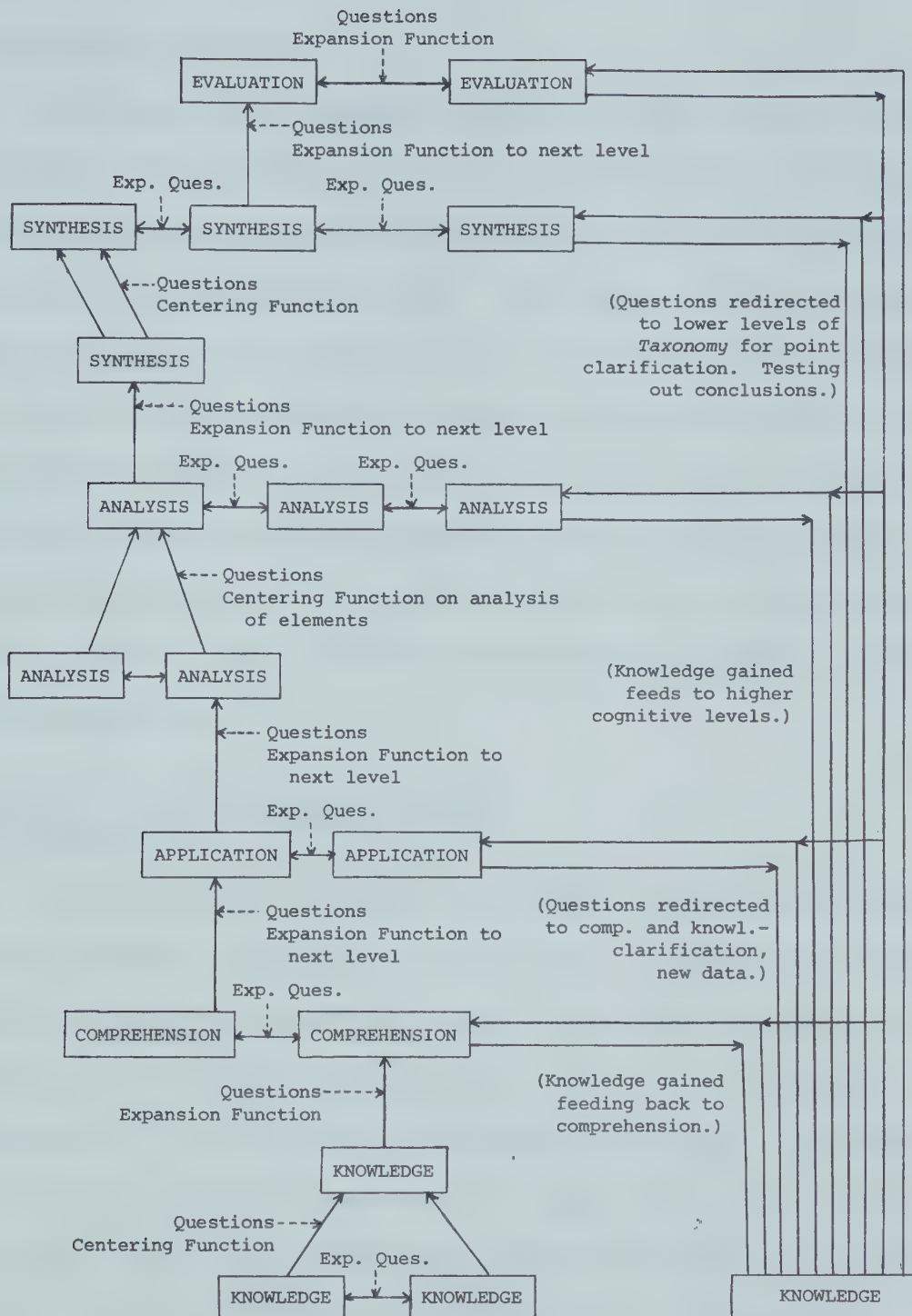




functions—centering, expansion, distribution and ordering. Using Bloom's Taxonomy to identify cognitive stages of questions, Hunkins demonstrates how a hierarchical levels-system of questioning may be implemented. This system involves classifying questions at each level of the taxonomy: knowledge, comprehension, application, analysis, synthesis and evaluation, with knowledge representing the lowest level of thinking and evaluation the highest level. Each level represents a progressively higher level of thinking. Discussions, he points out, may be structured so that questions may be posed at each level of the system and as pupils progress from level to level he engages in an increasingly higher level of thinking. At each level however questions may be asked which center or expand pupils' thinking at that level before progressing to a higher level. The diagram as presented in Figure 3 represents this technique.

Questions may be begun at any level of the Hunkins' system. A question begun at the analysis level for example, might require that succeeding questions concerned with centering or expanding be raised. Or some questions might drop back to a lower level to gain specific facts or understanding. A question may be asked at the knowledge level and then expanded at this stage before raising a higher-level comprehension question. At this point further expansion questions may occur before raising an application level question, and so on. Expansion can occur at any level as well as raising and lowering the level of questioning at any particular point. The direction that questioning will take depends entirely upon the pupil's response. In other words, many questions cannot be planned because they will





NOTE: The solid lines represent the questions asked.

SOURCE: F. P. Hunkins, *Questioning Strategies and Techniques*. Boston: Allyn and Bacon, 1972, p. 104.

Figure 3

Hunkins' Questioning Strategy



be on-the-spot questions.

Unfortunately the samples of questions which Hunkins gives to demonstrate certain aspects of his strategy are within the context of social studies and pose the same limitations as already discussed in relation to Taba's cognitive map. Furthermore, these question samples are given within paragraphs that discuss descriptively how one might proceed at a certain point in the strategy but are not used in conjunction with the diagram to demonstrate the strategy applied in an actual discussion situation during a period of verbal exchange. The actual application of the questioning strategy in a discussion situation is left to the intuition of the individual teacher with few specific guidelines.

#### Application to the Questioning Strategy of this Study

The application of Hunkins' questioning strategy was applied in the organizing of questions for the study. Questions were categorized for each story according to levels ranging from knowledge to evaluation using the Ohio Scales I rather than Bloom's Taxonomy. These questions, written from a generalization strategy, emphasized the higher levels of thinking—analysis, application, synthesis and evaluation. Each question was a key question from which discussion resulted. The key questions however were part of a sequence of inter-related questions. The relationship however was not straight vertical, extending through all levels of thinking. Rather the strategy included questions of expansion at particularly the analysis level, followed by questions that raised or lowered thinking, or





changed the focus of pupils' thinking. The actual diagram for the key questions looked somewhat like that presented in Figure 4, which is another way of expressing what Hunkins has expressed in a vertical representation. This diagram is for the questions designed for the story "Joaby" (Gage, 1973, pp. 40-45). The list of key questions follows the diagram.

It is not the intention of Hunkins that a discussion should carry through all the levels he has identified in his diagram. It is easy to be confused by this diagram however, since one's first impression is that every discussion should be a perfect example of his strategy. In actual practice however, this is not the case. The researcher found it extremely difficult to progress through all the levels during a discussion and in fact, never did. Hunkins describes how one could progress sequentially through all the levels but since no direct application of this is given by him in terms of diagramming actual discussion questions, it is possible he recognises the complexity of doing so.

#### DESIGNING AND EVALUATING THE GENERALIZATION STRATEGIES

For the purpose of this study a generalization strategy was designed to serve the same function as the 'cognitive map' which Taba (1967) formulated as part of a teaching strategy. In essence, it was to give direction to the researcher's questions for discussion periods. The evolution of the researcher's idea to use a map of generalizations has already been discussed in a previous section in which Taba is acknowledged as an influential source in designing the







Questioning Strategy for the Story "Joaby"—Key Questions

- |                  |   |
|------------------|---|
| (Fact)           | # 1. Who is Joaby?  |
| (Interpretation) | 2. What things in the story led to Davey's finding a new friend?  |
| (Analysis)       | 3. Can you explain why under normal conditions Joaby might not have become Davey's friend?  |
| (Analysis)       | 4. What special qualities developed in this short friendship?   |
| (Analysis)       | 5. Why do you think such a close friendship developed?  |
| (Synthesis)      | 6. Can you explain why the friendship changed when Davey returned to school?  |
| (Analysis)       | 7. What things made it very difficult to re-establish the friendship as it had been during the summer months?   |
| (Analysis)       | 8. Davey and Melissa (from previous story) both hesitated in making a decision. How is Davey's reason for hesitating different from Melissa's? How is it similar? |
| (Analysis)       | 9. How are Melissa and Davey both alike in their feelings at the end of the story?  |
| (Synthesis)      | 10. Suppose Davey had given Joaby the knife at the time he had planned. How might the story have changed?   |
| (Synthesis)      | 11. If you had been Davey, what might you have learned about friendship from your experience?   |
| (Evaluation)     | 12. Do you think Davey was unkind toward Joaby? Explain.  |





generalization strategy.

Having decided to devise a generalization strategy to direct the researcher's questions, two problems immediately faced the researcher. The first of these dealt with the question: Upon what aspects of a story should a discussion focus? The second: How does one determine these aspects? A statement by Sanders (1966) gave some insight for an approach to these problems. In discussing certain of the problems that exist in writing good 'knowledge' questions he states:

The greatest problem in this category is not how to write good test questions but rather how to determine the knowledge that is worth remembering and how to structure learning so that the emphasis is really on knowledge judged most important (pp. 19-20).

The phrase 'knowledge that is worth remembering' prompted the researcher to consider each story in terms of 'what aspects of the story might be of worth to pupils' and subsequently become a guide for a discussion. For any particular aspects of a story to be of worth to pupils, it seemed to the researcher that they relate to real life situations. The issue then became that of considering each story in terms of how the story might be of benefit to pupils in terms of real life experiences. Aspects of each story were then selected as important and formed into a series of meaningful generalizations that related to a theme, and extended beyond the content. These formed a guide for establishing questions.

In order to construct each generalization strategy however, a starting point was essential. Taba (1967) whose cognitive map design is discussed on page 117, began each map with a key question. The researcher however, saw it more in line with her general plan to



use a main idea generalization as a starting base. This idea or theme was taken from the general idea that appeared in the story. Once the theme was identified it was necessary to consider what generalizations, potentially useful to students and related to the theme, could be developed within the framework of the actual story. A number of generalizations were then listed and organized in a schematical form.

Generalizations, according to Taba (1967) can be formed in a schematical representation at both a horizontal and a vertical level. The researcher experienced difficulty with Taba's two dimensional design, however, and decided to use a design that represents the sequencing of generalizations at the vertical level only. The 'leaps' from generalization to generalization do not represent sequentially higher levels of thinking in terms of Hunkins' questioning strategy however, but a sequential development in the level of abstraction from one generalization to the next. It was believed by the researcher that the generalizations were conceptually hierarchical in that each idea developed from the previous idea and was therefore a higher level of abstraction.

The subjective nature of designing the strategies and of selecting generalizations that might be considered worthwhile for pupils in terms of meaningfulness to life situations, made it essential that each strategy be evaluated. A copy of each story together with the designed strategy and an evaluation sheet was given to three of five evaluators being used in the study. Prior to their evaluation however, the researcher met individually with the five evaluators and explained the research study, the concepts underlying the strategy



and the strategy design. Each evaluator was asked to contribute any suggestions he considered helpful as well as to react critically to each generalization strategy. The same three judges who evaluated the suitability of a particular story selection for the study, evaluated the generalization strategy for that same story. The evaluation sheet used by the judges can be found in Appendix B.

As a result of the evaluations one story selection was dropped from the study because of evaluator disagreement in the generalization strategy. For all other strategy designs there were no evaluator disagreements but a number of helpful suggestions were made which were used in either rewording a generalization, including an extra generalization in the design, or reorganizing the sequence of the generalizations.

#### DESIGNING AND EVALUATING THE KEY QUESTIONS

Each generalization strategy was used as a guide for writing questions for the particular story with which it corresponded. Those questions written for the first generalizations of the map tended to be factual and inference questions that established a knowledge base. Those written for the remainder of the generalizations emphasized the analysis, application, synthesis and evaluation levels of thinking, since it was the intention of this study to emphasize higher-levels of questioning. These questions were generally organized as Hunkins suggests. While they began at the lowest levels of knowledge or factual information they progressed to higher levels, at the same time allowing for expansion at a particular level, or lowering a level





for a focus change. They were not arranged straight vertically through all levels of thinking. More questions of one kind occurred for certain stories however. The number of any one kind depended upon the opportunity the story offered for writing that particular kind of question.

It was intended that each question of the strategy be posed during the discussion periods but the order in which they were raised depended more on the discussion itself. Therefore as Taba (1967) indicates they could not be established in any hard and fast fashion. If the discussion permitted the ordering as in the designed strategy then they were asked in that order.

The planned questions of the strategy were key questions which elicited responses. Any further planned questions were not attempted since subsequent questions after the raising of a key question depended entirely upon the pupils' responses. It was at this point that Taba and Hunkins' centering, expanding, raising and lowering techniques were applied (Hunkins, 1972; Taba, 1967).

The classification of each question of the prepared set of key questions for each story as rated by the researcher was judged by two professors of reading, both experienced in the area of questioning and question classification. All questions were studied for clarity of wording in addition to their classification according to the Ohio Scales I. Changes in wording were made according to the recommendations of one or both advisors. Where disagreement in category classification of a question resulted, questions were either recategorized or rephrased to obtain agreement between the researcher



and both professors. The sets of key questions for the stories used in the study are contained in Appendices S through X together with the generalization strategies from which they were developed.

#### DESIGNING OF THE PRE AND POST TESTS

The designing of the pre and post tests followed basically the same procedure as that used in forming questions for the questioning strategies. First, two stories were selected which were judged as appropriate for the study and comparable, by three evaluators. This process has already been described on page 99. A generalization strategy that was appropriate for both stories was then designed, in similar fashion as for all other story selections. The same evaluators who judged the suitability and the comparability of the stories, evaluated this generalization strategy. Any changes that were necessary such as rewording a generalization, interchanging generalizations or including a new generalization were made. A set of sixteen questions were then written for both stories. This list of questions followed the same general format as those written for all of the stories used in the discussion sessions (see questions for story "Joaby," p. 128). The initial questions were factual and inference level questions followed by a series of questions that emphasized the analysis, synthesis and evaluation levels of thinking. These were not sequential in their arrangement however. All sixteen questions were identical in wording and form for both stories except where names and situations differed within the two stories. Necessary word changes were made to accommodate these differences.



It is important to note however that application questions did not occur on the pre and post tests but occurred in the discussion sessions. This is accounted for by the nature of the application question itself. Since it involves the direct application of previously acquired information to a new situation, such questions could not be easily written for the pre and post tests. Since no prior teaching or discussion occurred before the testing session to provide relevant information that could be applied to a particular unfamiliar setting, there was no surety that pupils had the necessary information for application. Thus, because of the difficulty in writing application questions for the pre and post test content, they were omitted.

Each set of questions was assessed by two professors for (1) the clarity of the wording, (2) the comparability of the forms, and (3) their classification within the Ohio Scales I. A number of the questions were rewritten in accordance with advice given by one or both advisors. The researcher and professors agreed on all aspects judged in the final version of the test.

#### Pre and Post Test Procedure

The pre and post tests in their initial form represented basically the same format as the set of key questions designed for each story of the discussion sessions. Because the tests were to assess the effect of a treatment period on the ability of pupils to think independently at the higher-levels of thinking, the order of the questions in the strategy was not retained for the pre and post tests. The order of the first four questions was retained to help





the pupil establish a knowledge base. The remaining questions were arranged so as not to provide a lead from one question to the next. No provision was made to include probing techniques during the testing period. The comments made by the researcher in response to pupils' responses were limited to two statements. Because the pilot studies revealed that pupils sometimes hesitated for a lengthy period when giving a response, so that it was uncertain as to whether or not they had completed their answer, it was decided, after an appropriate pause, to ask: "Anything else?" Also, since the pilots indicated that pupils sometimes gave responses that did not show clearly what they meant, it was decided to use the statement: "What do you mean?" in such instances. No other responses to pupils' answers were given beyond these remarks. The specific directions given orally to each pupil can be found in Appendix F.

## THE PILOT STUDIES

### Pilot I

The first pilot study was conducted by the researcher during the period from January 28, 1975 to February 19, 1975 in an Edmonton elementary school. Thirty-one fifth graders from two small classes were involved in the project and constituted the population from which a small sample of six pupils was selected.

### Purpose of Pilot I

The major purpose of this pilot observation was to investigate the feasibility of the study, and to obtain pertinent information related to the Van Wageningen Analytical Reading Scales, the story



selections, the questioning strategies and the administrative procedures of the study. It was also to serve as a practice exercise for the researcher in determining her ability to conduct the study. The following specific questions were posed for the observation:

1. Does there exist within the fifth grade population pupils of average or above intelligence who have adequate language facility as defined by the study page 83, speak English as their native language, have a word accuracy score within their present grade level, and comprehend one year or greater below their present grade level according to the Van Wagenen?
2. Does the Van Wagenen give the same range of results as the present reading test administered by the school system?
3. Are the story selections of high interest potential for fifth graders, that is, are they the kind of stories fifth grade pupils like to read or can acquire an interest in after being exposed to them in a reading-discussion situation?

In order to answer these questions the following procedures were undertaken.

#### Pilot I Procedures

The Van Wagenen reading test was administered by the researcher to thirty-one fifth graders in two classrooms, in two one hour sessions. Scores for this test were then compared with scores for the school test, the Gates-MacGinitie Reading Test, that had been administered at the beginning of January, 1975. Results indicated a spread ranging from approximately 2.4 to 6.9 for the Van Wagenen and 3.7 to 7.4 for the school reading test. While the spread was lower for the Van



Wagenen than for the school test, the range for both reading tests was approximately the same. Pupils who scored low on the school test scored low on the Van Wagenen, but lower than on the school test. Pupils who scored high on the school test scored high on the Van Wagenen but lower than the school test. Except for four instances, all pupils scored lower on the Van Wagenen which is possibly explained by the more rigorous tasks found within the Van Wagenen than the school test. School files were then consulted for IQ ratings of those pupils who scored one year or greater below their present grade level on the Van Wagenen. All possible subjects were then screened for English as a first language, and language facility. Any pupils scoring an average or above rating on the Canadian Lorge-Thorndike Intelligence Tests, Verbal Battery, and were recommended by their teachers as experiencing no obvious difficulty with the expressive or receptive aspects of language were included as possible subjects. A final screening was done to assess word accuracy. The Schonell Graded Word Reading Test was administered individually to the possible subjects. It was decided that any pupil scoring two months below his grade level of 5.5 would be included in the sample. Furthermore, it was noted that those scoring greater than two months below 5.5 gave evidence of experiencing difficulty with syllabication skills and the sound-symbol association for certain nonphonemic syllable units.

This final screening yielded six pupils as a sample for small group discussion sessions, thus indicating that such pupils as set down by the criteria for selection, existed within schools though in small numbers per classroom.





The selected sample of 5 boys and 1 girl was then used in a seven day questioning-discussion study. During this period three story selections with their planned question strategies were used. Each daily session was approximately one hour in length and was taped in its entirety. Before the next session the tapes were transcribed totally and studied by the researcher for poor techniques in questioning and for effectiveness in the implementation of the questioning strategy. Notes were made of significant points that were adversely affecting the discussion and an attempt was made to improve on these in the following lessons. It became obvious after the first session that completing an entire question strategy in one discussion period was impossible. The asking of higher-level questions demanded that appropriate amounts of time be allowed for pupils to think and discuss. Approximately three to four higher-level key questions could be covered in a session.

Retaining pupil interest beyond the first session when a strategy was not completed became a problem. It was extremely difficult to break down the established concept that any story had to be completed daily. It appeared that the pupils viewed the exercise as focusing on reading a story more than the discussion aspect. Hence, the decision was made to make provision in the general instructions of the main study to control for this factor. It was decided however that no discussions would extend beyond three sessions unless pupils' interest warranted it.

At the end of the seven-day study each pupil from the sample met individually with the researcher to discuss their interest in the



three stories that had been discussed. The following questions were asked:

1. Did you enjoy these stories?
2. Which story did you enjoy most?
3. Was there any story you did not like?
4. If you were to read and discuss more stories, which of the stories would you like them to be like?

Reactions to the stories were very favorable. No pupil expressed a dislike for any story though one pupil expressed a dislike for the children's behavior in a particular story, thus making it the story he liked least. However he described it as 'a good story.' Three pupils decided which story they liked best and in this case chose two stories they liked best. All pupils expressed a desire to read more stories like those they had discussed but there was no consensus of preference for any one particular story.

Transcription of the tapes and observation by the researcher revealed that a 45-50 minute daily period would be more effective since there appeared to be a general tiredness during the last ten minutes. There was increased attention getting techniques used by the researcher during this time and behaviors such as teasing and giggling increased more during these last ten minutes.

Because a questioning strategy could not be completed in one session, it became necessary to devise a means of handling longer story selections than those used in the Pilot I study, and a way of providing for a memory loss from day to day. A system of dividing longer stories into sections; having pupils skim through the previous



day's story or part before proceeding either to read a following part or to discuss further; and having the researcher review in summary form the key questions discussed and the responses given for the previous day, was planned and implemented in a second pilot.

### Pilot II

A second pilot study was conducted during the period of April 24 to May 2, 1975. The test sample was selected from the same school population as that used in the main study. The selection and assigning of these pupils to the Pilot II study has been described on page 81 of Chapter III. Identical screening procedures to those discussed in Pilot I were used. A total of 7 subjects, 5 boys and 2 girls, comprised the sample.

### Purpose of Pilot II

The major purpose of this pilot observation was to investigate the suitability of the pre and post tests designed by the researcher, and to investigate refinements and changes made in certain procedural aspects identified in Pilot I as inappropriate. The following specific changes were investigated:

1. The suitability of a 45-50 minute period.
2. The effectiveness of carefully skimming a story or story part that had been read in a previous session before continuing the discussions.
3. The effectiveness of summarizing the previous day's discussion before continuing the discussion of a particular story.





## Pilot II Procedure

Each subject was administered the pretest individually over a two day period by the researcher. The pupils were required to read a story selection silently and to answer orally, sixteen questions asked by the researcher. The entire test was taped and later transcribed. Because of the nature of the test it was found that administration per student required 40-50 minutes.

Following the administration of the test the questions were reread by the researcher and each pupil was asked to point out words or phrases he did not understand. The transcriptions of each pupil's responses were then studied for any identifiable relationship between a pupil's response and wording difficulties which he identified. Since certain subjects gave "I don't know" responses for some of the questions containing confusable words or phrases they had identified, it was assumed that these words and phrases were a factor in their not being able to answer the questions. Only in one instance did there appear to be an identifiable relationship between the pupil's response and the difficulty noted. Pupils appeared to have overcome their lack of understanding for two words identified as difficult by using the total context of the question. The transcriptions of pupils' responses to one question revealed that the question was not specific enough in its meaning. To avoid any contamination due to question wording all six questions that suggested difficulties were reworded. The rewording of five of these questions meant merely substituting words or phrases they would probably understand for those that were difficult. The sixth question required the adding of a phrase to



make it specific. Rewording was done for all corresponding six questions of the posttest before it was administered to the Pilot II sample.

A four day discussion period was then conducted with the pilot sample using two longer story selections that had been used in the Pilot I study. It was observed that these stories could be read in sections without affecting the questioning strategy. A system of skimming prior to continuing reading the story appeared satisfactory. In order not to 'set' pupils thinking in a particular direction the summary of the previous day's questions and responses was limited to the exact key questions discussed and the exact responses given. This appeared to be effective without causing any bias.

At the end of the discussion session the posttest was administered individually in the same manner as the pretest. Tapes were transcribed and analysed in terms of the pretest. Since pupils responding "I don't know" on the pretest for certain questions which they identified as difficult gave a response other than "I don't know" on the posttest, it was assumed the question wording of the posttest was suitable. Since no other difficulties could be identified the revised form was assumed acceptable for the study. This revised form of the pre and post tests became the form used in the main study.

Although a 45-50 minute period provided only 25-30 minutes for discussion after pupils had read the story selection of part, it appeared to be more effective in terms of retaining interest and attention. It was decided to retain this period length for the main



study.

It was observed from this pilot study, and instances occurring within Pilot I, that differences existed in the quality of pupils' responses. On the basis of these differences and the researcher's classroom experience as a teacher, a system of classifying the complexity of pupil responses was devised. Because pupils of both pilots also gave a number of responses that did not appear appropriate for the question asked, a system of classifying inappropriate responses was devised. These systems are discussed in Chapter V, pages 147-149.

#### SUMMARY

This chapter has presented relevant material related to the designing of the research instruments used in the study. It has discussed the generic teaching strategies of Taba (1967) and the questioning strategy of Hunkins (1972), and their relevance in designing the generalization strategies and the planned key questions used by the researcher. The actual designing of these questions and their refinement were presented. The pilot studies presented an overview of how the administrative techniques and the pre and post test instrument were refined for the study.





## Chapter V

### ANALYSIS AND FINDINGS

The purpose of this study was to investigate in an exploratory manner the use of a questioning strategy in developing pupils' thinking related to questions of analysis, application, synthesis and evaluation. In order to determine the effectiveness of such a strategy, data consisting of transcribed tape-recorded responses to pre and post test questions, as well as transcribed daily discussion sessions between the investigator and a small group of fifth grade pupils were analysed. This chapter presents additional detailed information regarding the analysis of data and the findings, in two stages. Discussion of the findings has been limited to Chapter Six, the final chapter.

The first of these stages focusing on question one of the research questions, involves only the analysis and findings of pupil responses to the pre and post tests. A detailed account of how responses to these tests were analysed is given followed by the findings of the pre and post test analysis in terms of pupil progression from one level of response to a higher level as well as progress in the response complexity, and the frequency of Level 3, 4 and 5 responses to the analysis, synthesis and evaluation questions asked.

The second stage of the analysis and findings presented in this chapter focusses on questions two and three of the research questions, and involves the selection and analysis of five lesson



transcripts, and presents the findings.

#### ANALYSIS OF RESPONSES TO THE PRE AND POST TESTS

Complete sets of transcriptions of the teacher's oral questions and the pupils' oral responses to the pretest and the posttest were made by the researcher as an initial step of the analysis. The written transcriptions of pupil responses were then analysed for three aspects: the level of each response, the degree of complexity within each response, and the appropriateness of the response to the question asked.

##### The Level of Each Response

Numbers ranging from 1 to 15 were assigned each pupil participating in the study. These were marked on the horizontal line of a grid-like chart. Each question in the strategy was recorded by kind and number (i.e. 1-16 inclusive) along the vertical line of the chart. Ratings for each response of the pre and post tests for each pupil were then recorded in the appropriate space below the pupil's number and opposite the question being rated.

The Ohio Scales II for classifying pupil responses were used by the researcher for categorizing the level of each response. The levels within this scale ranged from Random Responses of Level 1 to Evaluative Thinking of Level 5. Levels 3, 4 and 5 however, comprised a continuum of higher-levels of thinking. Levels 1 and 2 meanwhile, were considered lower levels.



### The Degree of Complexity of Responses

In addition to obtaining the level of a pupil's response according to the Ohio Scales II, each response that fell within Level 3, 4 or 5 was further analysed for the degree of complexity it contained. Such analysis was undertaken to secure from the data a qualitative aspect that might have been lost through merely categorizing responses within a certain level. For example, instances of pupils progressing from a lower-level response to a higher-level response were later calculated for paired analysis, synthesis and evaluation questions of the pre and post tests. Pupils who did not progress to a higher response level on the posttest for any of these paired questions, may have progressed in terms of the degree of complexity of the response. That is, a pupil's response may have remained within a Level 3 rating, for example, on the posttest as on the pretest, but may have changed from a low complexity to an average complexity or a high complexity within that category. While his response would, therefore, not have indicated progress to a higher thought level it would have indicated progress in the complexity of the pupil's thinking. He, in other words, would have progressed from merely giving an interpretation of material he had read, or a hypothesis or a generalization about a particular aspect, for example, to supporting and extending these statements by giving examples or explanations that indicated he was aware of links or relationships between conditions within them. It was this kind of progress that the degree-of-complexity classification system was intended to assess. Sample excerpts of such progression in thought can be found in





## Appendix N.

This qualitative subsystem for classifying the complexity of a response was designed by the researcher on the basis of differences in responses noted from Pilot Study I and II, and based on her experiences as a classroom teacher in the elementary grades.

The degree of complexity in a pupil's response was determined by the amount of information he presented, i.e. the number of points of information he included, plus whether or not the information was accompanied or supported by an extended explanation or reasoning.

For example, the statement:

"She couldn't hear and she couldn't see"

presents two points of information. There is no expanding however in the form of an explanation. The following statement however, includes the same two points of information but is expanded:

"She couldn't hear or see like she couldn't see so she couldn't read like I was just doing, and she couldn't hear, so she couldn't listen like I was just doing."

A high degree of complexity (HDC), an average degree of complexity (ADC), or a low degree of complexity (LDC) was noted beside each Level 3, 4 and 5 response that a pupil gave. Each category of the subsystem was defined as follows:

A High Degree of Complexity. Represented by a response that contains three or more points of information that are extended or supported by examples, explanations or reasoning.

An Average Degree of Complexity. Represented by a response that contains one or two points of information that are extended or



supported by examples, explanations or reasoning.

A Low Degree of Complexity. Represented by a response that contains

information only and is not extended or supported in any way.

Using this system the previously quoted pupil statements would be classified as Level 2 and Level 3 ADC respectively.

### The Appropriateness of Responses

A third step of analysing responses of the pre and post tests involved noting and analysing responses that were not appropriate for the question asked. This approach was undertaken to avoid creating a false impression of gains as a result of the treatment, and to provide a diagnostic aspect. It was reasoned by the researcher that should all responses be classified by level and complexity only, a false impression would result in cases where pupils for example, responded at a Level 3 on the pretest and a Level 4 on the posttest but either the posttest response, or neither of the responses actually answered the question asked. Such responses were labelled as 'Not Fitting the Question' and coded NFQ (hereafter called NFQ responses). Though these responses were classified as unacceptable they were considered of much diagnostic value in terms of the kind of question that most frequently elicited such a response, and the kinds of errors in thinking that such responses indicated.

The appropriateness of a response was determined by a five point system devised by the researcher as a result of studying responses from the two pilot studies. A response was classified as 'Not Fitting the Question' and therefore unacceptable for any one of the following five reasons:



(a) The pupil did not comprehend the question fully, i.e. he comprehended only part of the question but omitted the other related part or parts.

(b) The pupil totally misinterpreted the question and gave an inappropriate response, i.e. he missed the specific point of the question.

(c) The pupil provided incorrect or misinterpreted information from the story.

(d) The pupil utilized relevant information but did not put it together in a clear or logical manner.

(e) The pupil utilized irrelevant information that he explained in a logical or illogical manner.

#### Rater Agreement for Classified Responses

To ensure precision and accuracy in recording responses within all three dimensions—level, complexity and appropriateness—rater agreement was obtained. Fifteen percent of all responses to inference, analysis, synthesis and evaluation questions were categorized by a university professor, experienced in analysing and categorizing pupil responses. These responses were randomly assigned using a table of random numbers as set out by Kerlinger (1973, p. 714). Responses elicited by factual questions were omitted from the survey in order to increase the accuracy of rating done by the researcher at the higher thinking levels. The researcher believed she was sufficiently competent in determining if a specific fact requested by a question had been given by a pupil or not. Rater agreement for those responses assessed was 96 percent on all aspects. Such a high rate of agreement





provided a high degree of confidence in the accuracy of the researcher's classification.

### Progress in the Level of Pupil Responses

Having classified all responses as indicated, the pre and post test responses were then further analysed for indications of progressions made by the control group and the experimental group. The progress sought was of two kinds—the instances of pupils progressing from a lower-level response on the pretest to a higher-level response for the comparable question on the posttest, and the instances of pupils demonstrating an increase in the degree-of-complexity of a response when his responses for comparable questions on the pre and post tests remained within the same level.

Progress was noted whenever an acceptable pupil response showed a lower level of thinking on the pretest and a higher level for the corresponding question on the posttest. For example, a pupil scoring 3 LDC on a particular question of the pretest and 4 LDC for the comparable question on the posttest was noted as having progressed a level in his response. One point was assigned this instance of progression and an additional point for each other instance occurring on the test. This progress is referred to hereafter as levels-progress.

An instance of progression was determined, however, first by the acceptability of the posttest response. If a posttest response fell within the NFQ category it was not considered as progress even when the pretest response indicated thinking at a lower level. For example, a response on the pretest at the 2 LDC level and on the



posttest at the 3 NFQ level, was not counted as an instance of progression even though there is evidence of a progression in the level of thinking employed in answering the posttest question. This approach was taken because of uncertainty in the mind of the researcher as to whether this was actual progress, particularly since a number of NFQ responses varied from misinterpreting the question or information of the story to presenting information in an illogical fashion. Furthermore, since such classification of responses occurred eight and nine times for the control group and the experimental group respectively, the difference was not considered great enough to influence the total results. These responses were included in a later part of the analysis when all NFQ responses were studied.

#### Progress in the Degree-of-Complexity of Pupil Responses

In addition to noting the number of instances of levels-progress for each pupil of the control group and the experimental group, points were also calculated for responses that did not progress to a higher level but progressed to a higher degree of complexity within the same level. A pupil who scored 3 LDC, for example on a question of the pretest and 3 ADC on the paired question of the posttest was considered to indicate an improvement in his thinking and given a one point credit for each instance of this progress. Such progression is hereafter referred to as degree-of-complexity progress. The degree-of-complexity progress and the levels-progress for each pupil were tabulated separately in the analysis.



### Between Group Comparisons

Having thus established the progress made by each pupil on the posttest a series of comparisons between control group and experimental group performances were made in order to answer question one of the research questions.

(a) Comparison of the total instances of levels-progress made by the experimental group as against those made by the control group for all analysis, synthesis and evaluation questions combined. No attempt was made to establish statistically whether or not these gains were significant since the study was intended to be exploratory-descriptive in nature.

(b) Comparison of the total instances of degree-of-complexity progress made by the experimental group as against those made by the control group.

(c) Comparison of the level at which the analysis, synthesis and evaluation questions were generally answered by the experimental group, pre and post test, as against the control group, pre and post test. Questions were grouped by type and responses tallied according to their level, i.e. Level 1, 2, 3, 4 or 5.

(d) Comparisons of (1) NFQ responses per question kind and (2) total NFQ responses for analysis, synthesis and evaluation questions combined, were undertaken. To provide diagnostic information concerning these responses the NFQ responses were further analysed as to the type of error evident in each response. Such information was believed by the researcher to indicate why pupils do not adequately respond to these particular kinds of questions,





and whether or not a questioning strategy such as that employed in the study resulted in any suggestive change in pupil performance.

#### FINDINGS OF THE PRE AND POST TEST ANALYSIS

Pre and post test responses were analysed for three particular aspects: the pupil progress made, the level at which each type of higher-level question was generally answered by pupils, and the appropriateness of responses to the questions asked. Findings related to each of these aspects are presented in the following sections.

##### Pupil Progress in Performance

When a pre-post test comparison of individual pupil performance was undertaken it was noted that progress had been made by pupils of both the control group and the experimental group. This progress was of two kinds: an increase in the instances of progression from a lower to a higher level of thought, and an increase in the degree-of-complexity of responses within a particular level. Table 8 shows these instances in a point form.

The number of instances of progression from a lower thinking level to a higher level occurred 8 times within the control group as compared with 19 times within the experimental group. When averaged out to the number of instances per-pupil, this resulted in a 1.0 instance per pupil of the control group, as compared with 2.7 instances per pupil of the experimental group (Table 9). Though these gains were not established statistically as being significant because of the nature of the study, they do indicate greater progress made by the experimental group. This progress becomes slightly more



Table 8

Levels-Progress by Individual Pupils of the Control Group  
and Experimental Group

Pupil Number	Progress by Code	Total Points of Progress
Control Group	1 1-3 LDC; 3 NFQ - 4 LDC	2
	2 2 NFQ - 3 LDC	1
	3 3 NFQ - 4 ADC	1
	4 2 NFQ - 3 LDC; 2 LDC - 4 LDC	2
	5 --	0
	6 2 LDC - 5 ADC	1
	7 1-3 LDC	1
	8 --	0
Total		8
Experimental Group	9 1-3 ADC, 4 ADC, 4 HDC; 2 LDC - 4 LDC	4
	10 1-4 ADC; 2 LDC - 4 ADC; 2 LDC - 3 LDC	3
	11 1-4 LDC, 4 ADC, 4 ADC, 4 HDC	4
	12 2-3 LDC	1
	13 1-3 ADC; 3 NFQ - 4 ADC	2
	14 3 LDC - 4 ADC; 2-3 LDC; 2 NFQ - 4 ADC	3
	15 2-3 LDC; 2 NFQ - 3 LDC	2
Total		19



Table 9

Average Gain Per Pupil of Experimental and Control Groups

Group	Number of Pupils	Instances of Progress	Average Gain Per Pupil
Control	8	8	1.0
Experimental	7	19	2.7

Table 10

Comparison of Individual Pupil Progress by  
Experimental and Control Groups

<u>Control Group</u>		<u>Experimental Group</u>	
Number of Pupils Making Gains	Instances of Progress	Number of Pupils Making Gains	
2	—————→ 0	←———— 0	
4	—————→ 1	←———— 1	
2	—————→ 2	←———— 2	
	3	←———— 2	
	4	←———— 2	





meaningful when compared on a points-per-pupil basis. Table 10 (p. 155) shows a comparison of the number of instances of progress made per pupil of each group. While both groups were equal in the number of pupils making two instances of progress at the middle of the scale, major differences existed between pupils making progress at the lower end of the scale as compared with those making progress at the upper end of the scale. Four out of eight pupils of the control group made one instance of progress each while two pupils made no progress. Within the seven pupils of the experimental group, one pupil progressed in one instance while two pupils each made progress on three occasions and two demonstrated progress in four instances. No pupil failed to make any progress. In a more concise form it means that six out of eight pupils of the control group made progress on one occasion or less as compared with four out of seven pupils of the experimental group who demonstrated three or four instances of progress. Furthermore, not only did all pupils of the experimental group make some progress, but the greater progress was made at the upper end of the scale.

When degree-of-complexity progress was considered there was less evidence of progress between groups. Table 11 shows only certain pupils within each group making such progress. Three pupils within the control group and four pupils within the experimental group gave evidence of progress. In terms of instances these were six and eight respectively, with four of the eight instances demonstrated by the experimental group being made by one pupil, and four of the six instances of the control group being made by one pupil. While



Table 11

Progress in the Degree-of-Complexity of Responses  
by Individual Pupils

Pupil Number		NFQ - LDC, ADC, HDC	LDC - ADC	ADC - HDC	Total
Control Group	1	1	-	-	1
	2	1	-	-	1
	3	-	-	-	
	4	-	-	-	
	5	-	-	-	
	6	-	-	-	
	7	-	-	-	
	8	2	2	-	4
Total		4	2		6
Experimental Group	9	-	1	-	1
	10	-	-	-	
	11	-	-	-	
	12	1	2	1	4
	13	-	-	-	
	14	1	1	-	2
	15	1	-	-	1
Total		3	4	1	8



slightly more pupils made progress within the experimental group than within the control group, this progress might only be considered marginal. The overall difference between groups lies in the fact that one pupil within the experimental group demonstrated two instances of progress over the control group.

Generally then, progress was made by pupils in progressing from a lower level of thought to a higher level, and in the degree-of-complexity of thinking within a particular level. When progress was calculated in instances for both groups, the experimental group showed greater progress in moving from one level to a higher level than the control group. Progress in developing more complex thinking within a particular level was only slightly greater for the experimental group than the progress made by the control group and therefore considered only marginal.

#### Level of Pupil Responses per Question Type

How pupils generally responded to the higher level questions of analysis, synthesis and evaluation, and how they progressed throughout the study in answering these kinds of questions as indicated by the pre and post test responses, were key points of concern for the study. Tables 12, 13, 14 and 15 show the breakdown of responses according to these features. Within group and between group comparisons reveal that a large percentage of responses to these higher-level questions by both groups fell below Level 3. That is, they were answered with either an inappropriate response, an "I don't know" response, a random response or a factual or literal response. When each question type was considered separately however, a slightly





Table 12  
Pupil Responses According to Level and Question Kind on Pre and Post Tests

Level of Response →	Pretest										Posttest														
	Control Group					Experimental Group					Control Group					Experimental Group									
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5	
Analysis Question																									
# 5	2	1		5			2			5			2	2		4			1			5	1		
6	2		4	2			2	2	2	1			2		4	2			2		3	1	1		
7	3	2		3			3	1		3			1	1	2	4			2		1	2	2		
10	2			6			2	1	2	2			4			4			2			4	1		
11	3	1	2	2			1		1	3	2		3	1		3	1		2			2	3		
12	6	1		1			6			1			7			1			5		1		1		
13			7	1				1	3	3				1	6		1				2	3	2		
Total	18	5	11	20	2		14	7	8	18	2		19	5	12	18	2		14	1	6	18	10		

Legend: 0 = NFQ  
1 = I don't know and random responses.



Table 12 (continued)

Level of Response →	Pretest										Posttest												
	Control Group					Experimental Group					Control Group					Experimental Group							
	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5					
Synthesis Question																							
# 8	4	2	1	1			2	2		2	1		6		1	1			2		2	3	
15	3	1	2	2			1	1		4	1		3	1	2	2			2		2	3	
Total	7	3	3	3			3	3		6	2		9	1	3	3			4		4	6	
Evaluation Question																							
#14	3		4	1					4	3			2		5	1					5	2	
16	2		1	1	4				1		6		1		2	4	1		1			6	
Total	5		5	2	4				5	3	6		3		5	3	4	1	1		5	2	6

Legend: 0 = NFQ  
1 = I don't know and random responses.



Table 13

Percentages for Pre and Post Test Responses by Level and Question Type

		Control Group						Experimental Group					
		Number					Percent*						
		Total Possible Responses					Percent* of Total Responses						
		Below Level 3	Level 3	Level 4	Level 5	Total Responses	Number						
		Below Level 3	Level 3	Level 4	Level 5	Total Responses	Below Level 3	Level 3	Level 4	Level 5	Total Responses		
Analysis Questions													
Pre	{	56	34	20	2	61 35 4	49	29	18	2	59 37 4		
Post	{	56	36	18	2	64 32 4	49	21	18	10	43 37 20		
Synthesis Questions													
Pre	{	16	10	3	3	62 19 19	14	6	6	2	43 43 14		
Post	{	16	10	3	3	62 19 19	14	4	4	6	28 28 43		

\* To nearest percent.





Table 13 (continued)

		Control Group						Experimental Group					
		Number						Number					
		Total Possible Responses	Below Level 3	Level 3	Level 4	Level 5	Percent* of Total Responses	Total Possible Responses	Below Level 3	Level 3	Level 4	Level 5	Percent* of Total Responses
Evaluation Questions	Pre	{ 16 }	10	2	4		62 12 25	14	5	3	6		36 21 43
	Post	{ 16 }	8	3	4	1	50 19 25 6	14	6	2	6		43 14 43

\* To nearest percent.



Table 14

Level 3, 4 and 5 Responses of the Control Group to Analysis, Synthesis and Evaluation Questions Showing the Degree-of-Complexity Within Each Level

Question	Pretest						Posttest					
	Number of Responses						Number of Responses					
	Level 3		Level 4		Level 5		Level 3		Level 4		Level 5	
	L	A H	L	A H	L	A H	L	A H	L	A H	L	A H
Analysis												
# 5	5						3	1				
6	1	1					2					
7	2	1					4					
10	6						4					
11	2		2				4					
12	1						3		1			
13	1						1					
Total a	18	2	2				17	1	1	1		
Synthesis												
# 8	1		1				1		1			
15	2		2				2		2			
Total b	3		3				3		3			
Evaluation												
#14		1						1				
16	1		4				2		3	1		1
Total c	1	1	4				2	1	3	1		1
Total (a+b+c)	22	3	7	2			22	2	4	4	1	1



Table 15  
Level 3, 4 and 5 Responses of the Experimental Group to Analysis, Synthesis and Evaluation Questions Showing the Degree-of-Complexity Within Each Level

Question	Pretest						Posttest					
	Number of Responses						Number of Responses					
	Level 3		Level 4		Level 5		Level 3		Level 4		Level 5	
	L	A	H	L	A	H	L	A	H	L	A	H
Analysis # 5	5						4	1		1		
6		1					1		1			
7	3						1	1	2			
10	2						4			1		
11	2	1			2			2		1		
12	1						1					
13	3						3			1		
Total a	16	2			2		14	4		2	6	2
Synthesis # 8	2											
15	4			1			2		3	2		
							2			1		
Total b	6			1	1		4			5	1	
Evaluation #14	3											
16				5	1		2			4	2	
Total c	3			5	1		2			4	2	
Total (a+b+c)	25	2		6	2	2	20	4		6	13	3





different perspective resulted within each question kind.

The analysis questions elicited 'below Level 3' responses 59 percent of the time and 43 percent respectively on the pre and post tests for the experimental group (Table 13). For the control group these responses were more frequent, occurring 61 percent and 64 percent, respectively. Interpreting and apply responses of Level 3 rated second highest and according to Tables 14 and 15 were generally of a low degree of complexity. Responses of theorizing and hypothesizing, Level 4, occurred least frequently. Level 4 responses, though increasing by 16 percent for the experimental group with no progress being made by the control group, still remained the least frequent response.

The synthesis questions generally elicited responses that fell below Level 3 within the control group on both the pre and post tests. The experimental group however, tended to respond to the synthesis question at Level 3 and below with equal frequency. Observable progress was made within this group on the posttest performance. While a decrease occurred in the below Level 3 responses and the Level 3 responses, the Level 4 responses tripled from the pretest to become the most frequent response to the synthesis questions on the posttest (Table 13). If we combine the below Level 3 responses and the Level 3 responses however, it should be noted that the experimental group's responses generally fell below Level 4 in spite of progress made at this level.

In terms of response quality as shown in Tables 14 and 15 all Level 3 responses of both groups to synthesis questions were of



a low degree of complexity on both the pre and post tests. Pupils of both the experimental and the control groups improved in the quality of their Level 4 responses, however. While the pretest responses of this level were generally of a low, unsupported quality, those of the posttest were supported showing an average degree of complexity for the control group, and an average to high degree of complexity for the experimental group.

The evaluation questions however, appeared to present the greatest problem to pupils answering them. Only one pupil of the control group in one instance in the entire study engaged in evaluative thinking that gave evidence of supportive criteria for his decision. Generally pupils quoted factual support for a choice they had made or hypothesized to explain his choice, but did not actually make an evaluative decision. Responses to evaluation questions on the pre and post tests were generally below Level 3 for the control group, rating 62 percent and 50 percent respectively for each test. The experimental group meanwhile gave approximately the same number of below Level 3 responses as Level 4 responses on the pretest to the evaluative type questions. Frequencies of responses for both these levels were identical on the posttest. These rated 36 percent and 43 percent respectively on the pretest, and 43 percent for each of these levels on the posttest (Table 13). Responses that fell within Levels 3 and 4 for both the experimental group and the control group were generally unsupported and of a low degree of complexity (Tables 14 and 15).

It is important to note that in classifying evaluation



responses it was not the final choice or decision that was categorized but the evidence of reasoning that used criteria for judging which led to the decision. For example, the response in the following sample:

Q. Who do you think was the most important person in Helen's life and why?

R. Ann Sullivan because she taught her. (Main Study)

gives no criteria for selecting Ann Sullivan as the most important person in Helen's life. The factual statement "she taught her" is not a criterion for judging Ann as the most important person but is factual support that extends the choice. Neither does it go beyond the literal information given in the story. In the following response, the criteria for selecting Ann are clear and the response is an evaluation:

R. Well like I think the most important person would be the one who helped you the most—did the most for you. Lots of people did things for Helen like her mother and all those other teachers. But it was Ann who really taught her how to speak with people and that. So I'd say she did the most so it was Ann who was the most important.

(Pilot II)

This response was therefore classified as Level 5 showing an average degree of complexity. The previous response however, was classified as a Level 2 or factual response.

On occasion pupils gave responses which appeared to have criteria for judging implicit within the statement but not clearly stated such as in the following responses:





Q. Is every blind-deaf person likely to be as successful as Helen Keller was—why or why not?

R. #1. No, well in those days they like well they might not be as lucky to get a person to help them like Helen did.

R. #2. Yes, because we have Braille now that they might be able to understand easier.

R. #3. No. Well (pause) not everybody can learn. Well, I don't know, I can't explain it. Well, it kinda depends on the teacher that teaches them.

Such responses were classified as theorizing or hypothesizing within Level 4. They were not considered to be evaluative responses as described in the Ohio Scales II.

#### Pupils' Overall Performance in Response to the Higher-Level Questions

Table 16 presents the overall performance of the experimental group on the pre and post tests. While 53 percent of the total responses to all higher-level questions of analysis, synthesis and evaluation were categorized as below Level 3 on the pretest, this percentage was reduced to 40 percent on the posttest. Although no improvement was evident in the number of NFQ responses given by pupils of this group, there was a general trend of improvement in the Level 4 responses. An increased number of responses, varying from 13 percent on the pretest to 29 percent on the posttest was noted. Level 1 responses decreased within this group. Whereas 13 percent of pretest responses were "I don't know" responses or "I can't answer that," or



Table 16  
Experimental Group Pre and Post Test Response Comparisons for Combined  
Analysis, Synthesis and Evaluation Questions

		Number of Responses					
Questions	NFQ Responses	Level 1	Level 2	Level 3	Level 4	Level 5	Total
Analysis	14	7	8	18	2		49
Synthesis	3	3		6	2		14
Evaluation			5	3	6		14
Total	17	10	13	27	10		77
Percent	22	13	17	35	13		
		53%					
Analysis	14	1	6	18	10		49
Synthesis	4			4	6		14
Evaluation	1		5	2	6		14
Total	19	1	11	24	22		77
Percent	25	1	14	31	29		
		40%					

Pretest

Posttest

Pretest

Posttest



random responses of one or two words, only one percent of the post-test responses were of this nature. Slight movement between levels was also noted, in that Level 2 and Level 3 responses decreased as Level 4 responses increased. This would necessarily include responses that moved from Level 2 to Level 3, and from Level 3 to Level 4.

Overall progress such as that observed within the experimental group was not evident in the control group. Comparison of pre and post test performance indicated that pupils responded identically in the proportion of below Level 3 responses to higher-level questions (Table 17). Responses falling below Level 3 for these questions ranked 62 percent on the pretest. This proportion was maintained on the posttest. This group's performance remained approximately constant for Level 3 and 4 responses of the pre and post tests and gave evidence of a slight one percent gain in Level 5 responses. Whereas no pupil within the experimental group gave a Level 5 response that indicated judgement using criteria on either the pretest or the posttest, one pupil of the control group gave evidence of responding at this level on the posttest. It is important to note that when the overall group's performance is considered in terms of total responses per level, as in Table 17, the individual pupil levels-progress achieved on the posttest as discussed earlier in the findings (re Table 8 ), is not reflected in this overall table. This is accounted for by the fact that there were pupils within this group who gave responses to the analysis, synthesis or evaluation questions on the posttest that were actually at a lower level than their corresponding responses on the pretest. Consequently, when totals are calculated





Table 17

Control Group Pre and Post Test Response Comparisons for Combined  
Analysis, Synthesis and Evaluation Questions

Questions	NFQ Responses	Number of Responses					Total
		Level 1	Level 2	Level 3	Level 4	Level 5	
Analysis	18	5	11	20	2		56
Synthesis	7	3		3	3		16
Evaluation	5		5	2	4		16
Total	30	8	16	25	9		88
Percent	34	9	19	28	10		
		62%					
Analysis	19	5	12	18	2		56
Synthesis	9	1		3	3		16
Evaluation	3		5	3	4	1	16
Total	31	6	17	24	9	1	88
Percent	35	7	20	27	10	1	
		62%					

Pretest

Posttest



for overall responses, these individual pupil gains became unapparent. Because the levels-progress achieved by the experimental group on the posttest is not suppressed as with the control group, it is assumed that these pupils made fewer regressions in their posttest responses.

In summary, pupils generally gave a large percentage of random, factual and literal responses to the higher-level questions of analysis, synthesis and evaluation. When each individual question type was considered the analysis question elicited more below Level 3 responses from both the experimental and the control groups. While interpreting and applying general knowledge of Level 3 ranked second highest in frequency, hypothesizing, imagining and theorizing of Level 4 occurred with least frequency. A high frequency of NFQ responses was noted within this level. The synthesis question also elicited more below Level 3 responses than Level 3 or Level 4 from the control group. The experimental group however demonstrated equal frequencies in responses of Below Level 3 and Level 3 on the pretest and on the posttest with an observable increase in Level 4 responses on the posttest. The evaluative question appeared to be the most difficult for pupils and generally elicited factual and interpretive responses of Level 3. While overall progress was observed within the experimental group, such progress was not observed within the control group.

#### Appropriateness of the Pupil Responses

One of the features noted in the pre and post test analysis is the high frequency of NFQ responses. They comprised one quarter



of the responses for the experimental group on the posttest and only slightly less on the pretest, and approximately one third of the responses given by the control group on both tests (Table 18). These responses occurred for all of the higher-level questions analysed though the experimental group gave only one such response when replying to evaluation questions.

Error 'b' or missing the specific point of the question was by far the most frequently occurring inappropriate feature in the unacceptable responses for all higher-level questions answered (Table 18). All other error features occurred only intermittently throughout the responses and with approximately equal frequency. Error 'b' appeared more frequently in responses to analysis questions than synthesis or evaluation questions because of the larger number of questions asked within this level. When responding to synthesis and evaluation questions this feature occurred more frequently within the control group than the experimental group who demonstrated a scattering of error types for these questions. Giving irrelevant information in a logical or illogical manner, error 'e', and giving incorrect or misinterpreted information, error 'c', occurred only rarely among both groups. Difficulty in organizing relevant information in a clear and logical manner, error 'd', appeared mainly within the control group when responding to synthesis questions on the posttest. Otherwise this difficulty was scattered.

Further analysis of the error 'b' responses, i.e. missing the specific point of a question, suggests that pupils listening to the question as it was spoken to them and repeated, frequently cued in to





Table 18

NFQ Responses by Question Type—Control and Experimental Groups

Question	Control Group						Experimental Group					
	Pretest			Posttest			Pretest			Posttest		
	Frequency			Frequency			Frequency			Frequency		
	Error Type			Error Type			Error Type			Error Type		
	a	b	c	d	e	Total	a	b	c	d	e	Total
Analysis #5	2				2							
6	1	1			2							
7	2			1	3							
10	2				2							
11	2	1			3							
12	6				6							
13												
Total	2	14	1	1	18		1	16	2	19		14
Synthesis #8	1	2		1	4		2		3	1	6	
15	3				3		1		2		3	
Total	1	5		1	7		3	5	1	9		4
Evaluation #14	1		1	1	3		2				2	
16		1		1	2		1				1	
Total	1	1	1	1	5		3			3		1



the first part of the question and/or the last part but did not note the specific points between nor relate these to the final part of the question. For example the question:

#8 You notice in the story that Dr. Howe and Jeannette Howe taught Laura to read first. Then they taught her to speak with her hands. Why do you think they trained Laura that way?

was frequently answered either as (1) Why did they teach her to read? or (2) Why did they train her? or (3) Why did they teach her to speak with her hands? No relationship was established between reading first and then speaking with the hands as a particular method. The following responses demonstrate this:

Q #8 R. . . . [to] let her help herself because when she grows up she could have at least a responsible job . . .

R. Like she couldn't see or hear but she still had the sense of touch and she could feel the metal keys. That's all.

R. So she could talk to other people and not feel so lonely.

To summarize, the NFQ response occurred for all questions asked but occurred with much higher frequency in answering analysis questions. Missing the specific point of the question was the most noted error feature. The frequency of NFQ responses for each individual pupil together with all other responses he gave to the questions of the pre and post tests, are contained within the main data sheet, Table 19.



Table 19  
Classification of All Pre and Post Test Responses by Test Item—Control Group and Experimental Group

Ques- tion #	Kind	Control Group										Experimental Group				
		Pupil 1	Pupil 2	Pupil 3	Pupil 4	Pupil 5	Pupil 6	Pupil 7	Pupil 8	Pupil 9	Pupil 10	Pupil 11	Pupil 12	Pupil 13	Pupil 14	Pupil 15
1	Fact	Pre 2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)
	Post	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)
2	Fact	Pre 2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)
	Post	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)
3	Fact	Pre 2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)
	Post	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)	2 (F)
4	Inference	Pre 1 NFQ (b)	2 NFQ (c)	1 (DK)	3 NFQ (b)	1 (DK)	3 NFQ (a)	1 (DK)	3 NFQ (b)	1 (DK)	1 (UG)	1 (DK)	1 (UG)	1 (DK)	3 NFQ (b)	3 NFQ (c)
	Post	3 NFQ (b)	2 NFQ (c)	3 NFQ (b)	3 NFQ (b)	1 (DK)	2 NFQ (b)	1 (UG)	2 NFQ (b)	1 (DK)	2 NFQ (b)	1 (DK)	1 (UG)	1 (UG)	3 ADC	3 NFQ (b)
5	Analysis	Pre 3 LDC	2 NFQ (b)	3 LDC	2 NFQ (b)	3 LDC	1 (DK)	3 LDC	3 LDC (b)	3 NFQ (d)	3 LDC	1 (DK)	3 LDC	3 LDC	3 LDC	3 LDC
	Post	3 LDC	1 (DK)	3 NFQ (e)	3 LDC	3 LDC	3 NFQ (b)	1 (DK)	3 ADC	3 NFQ (d)	3 LDC	1 (DK)	3 ADC	3 LDC	3 LDC	3 LDC
6	Analysis	Pre 2 (F)	2 NFQ (b)	3 ADC	2 LDC	2 LDC	3 NFQ (c)	3 LDC	2 (F)	1 (DK)	3 NFQ (c)	1 (DK)	2 LDC	3 ADC	2 LDC	2 NFQ (b)
	Post	2 (F)	3 LDC	2 NFQ (b)	3 NFQ (b)	2 LDC	2 LDC	3 LDC	2 (F)	2 LDC	3 NFQ (c)	4 ADC	2 LDC	2 LDC	3 LDC	2 LDC
7	Analysis	Pre 1 (DK)	1 (DK)	3 NFQ (b)	3 LDC	3 ADC	3 LDC	1 (DK)	2 NFQ (e)	1 (DK)	3 NFQ (b)	3 LDC	3 NFQ (b)	3 LDC	2 NFQ (b)	3 LDC
	Post	3 LDC	1 (DK)	3 NFQ (b)	3 LDC	2 LDC	3 LDC	3 LDC	2 LDC	3 LDC	3 LDC	4 ADC	3 LDC	3 NFQ (d)	4 ADC	2 NFQ (b)
8	Synthesis	Pre 3 NFQ (b)	1 (DK)	2 NFQ (b)	3 LDC	4 LDC	3 NFQ (a)	1 (DK)	4 NFQ (e)	3 LDC	1 (DK)	1 (DK)	3 LDC	4 NFQ (c)	4 LDC	3 NFQ (e)
	Post	3 NFQ (b)	3 NFQ (b)	3 NFQ (e)	3 NFQ (d)	3 NFQ (d)	3 LDC	3 NFQ (d)	4 ADC	4 NFQ (e)	4 ADC	4 ADC	3 LDC	4 NFQ (c)	4 ADC	3 LDC
9	Inference	Pre 2 NFQ (b)	1 (DK)	2 LDC	3 NFQ (b)	3 LDC	1 (DK)	1 (DK)	2 NFQ (e)	1 (DK)	3 NFQ (b)	1 (DK)	2 LDC	3 LDC	3 NFQ (b)	3 LDC
	Post	2 NFQ (b)	1 (DK)	2 LDC	2 NFQ (c)	2 LDC	1 (DK)	1 (DK)	1 (DK)	2 LDC	3 NFQ (b)	2 NFQ (c)	3 NFQ (b)	2 LDC	2 NFQ (c)	2 LDC
10	Analysis	Pre 3 NFQ (b)	3 NFQ (b)	3 LDC	3 LDC	3 LDC	3 LDC	3 LDC	3 LDC	1 (DK)	2 LDC	3 LDC	3 NFQ (b)	3 NFQ (b)	3 LDC	2 LDC
	Post	3 NFQ (b)	3 NFQ (e)	3 LDC	3 LDC	3 LDC	3 LDC	3 NFQ (b)	4 NFQ (b)	4 HDC	3 LDC	3 LDC	3 NFQ (b)	3 NFQ (b)	3 LDC	3 LDC
11	Analysis	Pre 1 (DK)	3 NFQ (a)	3 LDC	3 LDC	4 HDC	3 NFQ (a)	4 HDC	3 NFQ (b)	3 LDC	2 LDC	4 HDC	3 ADC	4 HDC	3 LDC	3 NFQ (a)
	Post	1 (DK)	3 LDC	3 LDC	3 LDC	4 HDC	3 NFQ (b)	3 NFQ (a)	3 NFQ (b)	3 ADC	4 ADC	4 ADC	3 ADC	4 HDC	4 NFQ (b)	3 NFQ (b)
12	Analysis	Pre 3 NFQ (b)	1 (DK)	3 NFQ (b)	3 NFQ (b)	3 LDC	3 NFQ (b)	3 NFQ (b)	3 NFQ (b)	3 NFQ (b)	3 NFQ (b)	3 NFQ (b)	3 NFQ (c)	3 LDC	3 NFQ (b)	3 NFQ (b)
	Post	3 NFQ (b)	3 NFQ (b)	3 NFQ (b)	3 NFQ (b)	3 LDC	3 NFQ (b)	3 NFQ (b)	4 NFQ (b)	3 NFQ (b)	3 NFQ (b)	3 NFQ (b)	3 NFQ (b)	3 LDC	3 NFQ (b)	3 NFQ (e)
13	Analysis	Pre 2 LDC	3 LDC	2 LDC	2 LDC	2 LDC	2 LDC	2 LDC	2 LDC	2 LDC	2 LDC	1 (DK)	2 (F)	3 LDC	3 LDC	3 LDC
	Post	2 LDC	2 (F)	2 LDC	4 LDC	2 LDC	2 LDC	1 (DK)	2 LDC	4 LDC	2 LDC	2 LDC	3 LDC	3 LDC	4 ADC	3 LDC
14	Evaluation	Pre 4 NFQ (a)	2 LDC	2 NFQ (c)	3 ADC	2 ADC	2 LDC	2 LDC	3 NFQ (d)	2 LDC	3 LDC	2 LDC	3 LDC	2 LDC	3 LDC	2 LDC
	Post	2 LDC	2 LDC	2 NFQ (b)	3 ADC	2 ADC	2 LDC	2 LDC	3 NFQ (b)	2 LDC	3 LDC	2 LDC	3 LDC	2 LDC	4 NFQ (b)	2 LDC
15	Synthesis	Pre 3 NFQ (b)	3 LDC	3 NFQ (b)	4 LDC	4 LDC	1 (DK)	3 LDC	4 NFQ (b)	1 (DK)	3 LDC	3 LDC	4 ADC	3 NFQ (c)	3 LDC	3 LDC
	Post	3 NFQ (b)	3 LDC	3 NFQ (d)	4 ADC	3 LDC	1 (DK)	4 NFQ (d)	4 ADC	4 ADC	3 LDC	3 LDC	4 HDC	4 ADC	4 NFQ (b)	4 NFQ (b)
16	Evaluation	Pre 3 NFQ (b)	3 LDC	3 NFQ (e)	4 LDC	4 LDC	2 LDC	4 LDC	4 LDC	4 LDC	4 LDC	4 LDC	4 LDC	4 ADC	4 LDC	2 LDC
	Post	4 LDC	3 LDC	4 ADC	4 NFQ (b)	4 LDC	5 ADC	3 LDC	4 LDC	4 LDC	4 LDC	4 LDC	4 ADC	4 ADC	4 LDC	4 NFQ (e)





Table 19 (continued)

Legend for Pupil Responses to Pre and Post Tests:

- 1 = Level 1 - Random responses
- 2 = Level 2 - Literal
- 3 = Level 3 - Giving illustrations, applying, interpreting
- 4 = Level 4 - Imagining, hypothesising, theorizing
- 5 = Level 5 - Evaluating, using criteria
- NFQ = Not fitting the question
- LDC = Low degree of complexity
- ADC = Average degree of complexity
- HDC = High degree of complexity
- (F) = Factual
- (UG) = Unsupported guess
- (DK) = Don't know
- (a) = Pupil did not comprehend the question fully
- (b) = Pupil misinterpreted the question and gave inappropriate response
- (c) = Pupil provided incorrect or misinterpreted information from the story
- (d) = Pupil utilized relevant information but did not put it together in a clear or logical manner
- (e) = The pupil utilized irrelevant information that he explained in a logical or illogical manner.



## SELECTION AND ANALYSIS OF LESSON TRANSCRIPTIONS

In order to answer questions two and three of the research questions, five 45 minute daily discussion lessons that had been taped during the discussion sessions of the experimental group, and transcribed, were analysed. The five lessons were selected from a total of thirteen of twenty sessions that had been conducted and taped with this group. Seven of the twenty transcribed lessons were eliminated as possible lessons for analysis because they were introductory lessons to a new story. This necessarily meant that they were shorter than all following lessons since approximately half the period involved speculating upon what the story was about and silent reading of the selection. Furthermore, these initial lessons to a new story involved the asking of a number of low-level key questions before raising higher-level questions. It was therefore felt that the initial lesson for each new story would not be comparable to sessions that involved approximately total discussion during the forty-five minutes and the asking of a higher frequency of analysis, application, synthesis and evaluation questions. The five lesson transcripts for analysis were therefore selected from the remaining thirteen lessons.

The decision of which five of the thirteen lessons to analyse was reached by first assigning numbers one to thirteen to each of these lessons. It was then arbitrarily decided to select the middle number and every third number above and below it which would give a fairly even spread between the lessons analysed. Consequently, lessons 2, 7, 11, 15 and 19 were chosen for analysis.

These transcriptions were then subjected to three stages of



analysis, each related to particular aspects of the research questions. The first of these stages dealt with the frequency of teacher-pupil participation and the pupils' questioning activity, and involved isolating various aspects of teacher and pupil verbal input. The second stage, relating to the frequency of pupil responses at Level 3, 4 and 5 in answering higher-level questions, involved classifying in detail the teacher's questions and the pupils' responses. The final stage, involved analysing all teacher questions and statements in terms of function techniques employed so that a comparison of assisted and unassisted pupil responses to higher-level questions could be made. Each stage is discussed in detail.

#### The Frequency of Teacher-Pupil Participation and Pupils' Questioning Activity

Analysis of the frequency of teacher-pupil participation and pupils' questioning activity involved a process of color coding throughout each lesson transcript, the following features: all teacher's questions and statements, all pupil responses (statements and questions), all pupils' responses made in response to other pupils' questions and statements as opposed to those in response to the teacher's, and all questions initiated by pupils. So that comparisons could be made between pupil and teacher performance from lesson to lesson and within all five lessons, the frequencies of these features were recorded in a table form and calculated into percentages. The frequencies of pupil responses and teacher's statements and questions were expressed as percentages of the total verbal interaction per lesson and for all combined lessons. Similar





calculations were also made for pupils' responses to their peers and those made in response to the teacher. All pupil responses to other pupils' questions or statements and those in response to the teacher, were recorded and expressed as percentages of their total verbal input per lesson as well as for all lessons analysed. Comparisons were then made between pupil and teacher performance.

The frequency of pupil initiated questions was calculated however, nor for the purpose of comparing pupil and teacher questions, but to determine the extent to which pupils themselves asked questions. The number of questions asked per lesson and during all five lessons was recorded and calculated as percentages of the total pupil verbal responses for each lesson and for all five sessions. A comparison was then made between the proportion of questions asked by pupils in relationship to their responses that did not involve questioning.

The questions asked by pupils were further studied as to the kinds of questions they asked. Each question raised by a pupil was noted on a separate sheet of paper and studied within the transcript context to determine specific features about it. A brief note such as "asks question related to a point the previous pupil made" or "asks for question to be repeated" was written beside each. This list of comments became the framework from which it was finally decided what kinds of questions pupils asked throughout the sessions. The list was summarized into six descriptive headings and the questions asked classified according to these heading. The frequency of each was recorded beside the descriptive statement as well as a letter code for the statement.



Pupils' questions were further studied on a per pupil basis to obtain information relating to individual pupil participation. The number of questions asked by each pupil was recorded in table form for that pupil, together with a letter coding for the kind of questions he asked and the number of each kind. The lessons to which his questions related were recorded in order to determine a possible pattern in his questioning activity, that is, was his questioning activity continuous or sporadic throughout the sessions? In this manner it was possible to consider pupils' questioning individually as well as collectively.

#### Categorizing Teacher's Questions and Pupils' Responses

In order to study the frequency of Level 3, 4 and 5 responses to higher-level questions it was necessary to analyse in a more detailed manner the total verbal interaction of the pupils and teacher. This involved categorizing each teacher question and pupil response of the five lessons according to the Ohio Scales I & II. In addition, pupil responses were further categorized, as in the pre and post tests, with respect to the complexity of the response within Levels 3, 4 and 5 of the Ohio Scales II, and the appropriateness of the response to the question asked. The systems for classifying complexity and appropriateness of responses discussed in the classifying of pre and post test responses were utilized also for the classifying of transcript responses. It should be noted however, that while basically the same procedure was followed for classifying all student responses, the situation was somewhat different. The



responses and questions being categorized within the lesson transcripts were the results of an interactive process among a group as compared with individual questions and responses of the pre and post test situation. Consequently a number of differences were to be expected which necessarily made the classifying not as straight forward as for the pre and post tests. For example, the nature of the discussion session allowed pupils to introduce a focus change from that set by the teacher's question, and to comment on or question points made by another pupil or by the teacher. Responses such as these could not have occurred on the pre and post tests since that situation was not an interactive one. Therefore, responses necessarily resulted in the interactive process which did not relate necessarily to the teacher's question asked but could not be classified as NFQ responses since they were a vital part of the discussion process from which further teacher questions and discussion developed. It was therefore necessary to consider as NFQ responses only those which (a) were given as a direct, immediate response to the teacher's question and (b) were inappropriate to that question.

A similar difference also existed when classifying pupils' responses according to levels. Because the situation was an interactive one, responses necessarily had to be considered not only in terms of the story content, as in the pre and post tests, but in addition, in terms of the previous lesson discussions, as well as the content of pupil responses made prior to the one being classified. For example, a pupil may have appeared to have analysed a situation by his response but when all interaction prior to his response was





considered, his response may have merely been literal interpretation of what several pupils had discussed; or it may have been the recall of points made in the previous lesson. Consequently, it was necessary for the researcher to read all previous lesson transcripts related to a particular lesson prior to analysing the one under study, as well as to consider each response in view of the discussion preceeding it. The level of each response together with its degree of complexity and where necessary, appropriateness, was then noted in code form beside the response.

Because this study was concerned basically with developing responses to analysis, application, synthesis and evaluation questions, only responses to these questions were considered in the final analysis. Each question then, that was of these kinds was recorded and totalled for each of the five sessions studied. All responses to such questions that fell within Levels 3, 4 and 5 of the Ohio Scales II were also totalled and recorded. Responses within each of these levels were further broken down in low, average and high and totals recorded for each of these sub-divisions. Comparisons were then made between lessons for indications of changes in pupils' thinking within Levels 3, 4 and 5 when responding to higher-level questions.

#### Identifying Function Techniques in the Teacher's Questioning

Identifying all function techniques employed by the teacher in questioning—focusing, changing of focus, lowering, raising, expanding and refocusing—completed the final major stage in the



transcript analysis. All teacher questions and statements were analysed according to the functions noted above, and a letter code written beside each. Definitions of these functions as taken from the writings of Taba (1966; 1967) can be found in Appendix P, together with the letter coding.

Having identified all techniques employed by the teacher, the transcripts were then analysed for a comparison of unassisted Level 3, 4 and 5 responses to higher-level questions, with those that were assisted through raising, lowering and expanding techniques. All analysis, application, synthesis and evaluation questions previously noted and numbered throughout each transcript were again identified and the verbal interaction following each studied for the features of raising, lowering and expanding used by the teacher. When no such technique was identified, and the response following the question was a Level 3, 4 or 5, a recording was made of that response by level and complexity under the heading 'unassisted.' When the interaction following the question showed employment by the teacher of one or more of the techniques noted above, the response, if within Level 3, 4 or 5, was classified as 'assisted,' and recorded by level and complexity. Total responses were then obtained for each level within the 'assisted' and within the 'unassisted' divisions.

#### Evaluating Pupil Performance During Lesson Discussions

In order to be able to compare responses to these higher-level questions from lesson-to-lesson in a meaningful way, it was necessary to control for the discrepancies that existed in the number of



high-level questions asked within each lesson. Pupil responses were therefore calculated in relationship to the number of questions asked and expressed as an average number of responses per question. Averages were calculated for the overall Level 3 and Level 4 responses and the Assisted and Unassisted Level 3 and Level 4 responses. No such calculations could be made for Level 5 responses because of the infrequency of these responses. Comparisons were then made of the average responses per question for each lesson.

Thus the analysis of the data throughout the various stages lead to a variety of recorded information that allowed for a series of comparisons to be made. Comparisons were made not only in terms of total overall performances for certain aspects of the study, but whenever necessary, recorded lesson-by-lesson data allowed for comparisons to be made from one lesson to the next, thus indicating progress made over time.

#### FINDINGS OF THE LESSON TRANSCRIPTION ANALYSIS

Findings, related to each of the three stages of analysis are presented under the following headings: A comparison of teacher and pupil participation; Pupils' questioning activity; Pupils' responses to higher-level questions and assisted and unassisted responses.

##### A Comparison of Teacher and Pupil Participation

A comparison of pupil responses with teacher questions and statements as shown in Table 20 indicates that pupils participated





Table 20

Teacher's Statements and Questions, Pupils' Responses,  
Pupils' Interaction with Peers and Pupils'  
Questioning Activity

Lesson	Total Teacher Statements and Questions	Total Pupil Responses	Pupil Responses to their Peers	Pupil Initiated Questions
# 2	88	98	1	1
7	88	145	20	4
11	87	126	15	4
15	146	237	42	9
19	148	232	37	8
Total	557	838	115	26



more frequently in discussion than did the teacher. This trend was observed not only in the overall performance for all five sessions studied but for each individual lesson analysed. When individual lessons were considered it was noted that the least discrepancy between teacher and pupil performance existed in Lesson #2 where 47 percent of the verbalizations were those of the teacher as compared with 53 percent by the pupils (Table 21). This means that pupils spoke only slightly more frequently than the teacher in what is almost a one-to-one relationship between the teacher asking a question and a pupil responding. The remaining lessons, however, show increased discrepancies in favor of pupil participation. While the proportion of pupil responses remain considerably greater than that of the teacher, it is not progressively so from lesson to lesson. The higher proportions were shown in Lessons #7 and #15 where pupils contributed 62 percent of the verbalizations as compared with 38 percent contributed by the teacher. However, the proportions of pupil responses for the remaining lessons were only slightly below 62 percent. The increase in pupil participation was not progressively cumulative. Analysis of the transcripts gave evidence of controls implemented by the teacher on certain occasions that reduced pupil participation. When expanding, refocusing, lowering or raising a particular pupil's thinking with regard to a certain question, other pupils sometimes could not or did not contribute while the teacher and pupil engaged in an exchange of discourse. Familiarity with the content being discussed also appeared to be related to pupil participation. For example, in discussing adult experiences and sea adventures in the



Table 21

Ratio of Teacher Questions and Statements  
to Pupils' Responses

Lesson	Total No. of Verbal Interactions	No. of Teacher Questions and Statements	Percent of Total Responses	No. of Pupil Responses	Percent of Total Responses
# 2	186	88	47	98	53
7	283	88	38	145	62
11	213	87	41	126	59
15	383	146	38	237	62
19	380	148	39	232	61





story "Gulliver the Great" pupils appeared to have greater difficulty contributing ideas than in the story "The Hundred Dresses" or "The Last Day of September" which dealt with more familiar childhood and school experiences.

Although pupils tended to speak more frequently than the teacher in each of the five sessions studied, the majority of these responses were related to the questions posed by the teacher. Table 22 shows the frequency of pupils' responses to other pupils' statements or comments per lesson, and such responses as a proportion of the total pupil participation per lesson, as well as for all five lessons combined. As can be seen in this table the greatest progress in pupils responding to their peers occurred between Lesson #2 and Lesson #7 where the ratio changed from 1 percent to 14 percent. Though this ratio fluctuated a few points higher and lower for the remaining lessons, it remained the overall percentage for the total performance of all five lessons. The findings indicate that these pupils responded to the teacher approximately 86 percent of the time while they responded to their peers 14 percent.

#### Pupils' Questioning Activity

Out of a total of 838 pupil responses, 26 of these were pupil questions as noted in Table 23. On the average pupils asked questions at a ratio of 3 percent to 97 percent. That is, 97 percent of their responses did not involve initiating questions. The proportion of questions pupils asked increased slightly and progressively from 1 percent to 4 percent from Lesson #2 to Lesson #15, giving an overall performance of 3 percent questioning activity for the five



Table 22

Proportion of Total Pupil Responses Elicited by Teacher's Questions  
and Statements and by Other Pupils' Responses

Lesson	Total Pupil Responses	Responses to Teacher's Questions and Statements	Percent of Total	Responses to Other Pupil's Responses	Percent of Total
# 2	98	97	99	1	1
7	145	125	86	20	14
11	126	111	88	15	12
15	237	195	82	42	18
19	232	195	84	37	16
Total	838	723	86	115	14



## Lesson 23

## Proportion of Pupil Questions to Total Pupil Responses

Lesson	Total Responses for Lesson	Number of Questions Initiated by Pupil	Percent Questions	No. of Other Responses	Percent Other Responses
# 2	98	1	1	97	99
7	145	4	3	141	97
11	126	4	3	122	97
15	237	9	4	228	96
19	232	8	3	224	97
Total	838	26	3	803	97





lessons studied.

When participation on an individual basis was considered the number of questions asked by each pupil ranged from one to three with the exception of one pupil who asked nine questions during the five lessons (Table 24). This pupil was the only pupil who gave evidence of participating in a series of lessons. While she asked no questions within Lesson #2 and Lesson #7, she asked questions in each of the following three sessions analysed, Lesson #11, 15 and 19. Questioning activity for the remaining pupils occurred only once or twice in one or two lessons.

Table 25 reveals the kinds of questions pupils generally asked within the five sessions studied. Basically, their questions fell within six categories with the most frequent question being that in which pupils questioned a hypothesis or speculation they themselves had made. This would be the "Well, suppose . . . what would happen then" type. Such questions accounted for 11 of the 26 questions asked or 43 percent of all pupil questions. The next most frequently occurring question raised by pupils were those questioning a point made by a previous pupil. Generally these questions expressed disagreement with what the previous pupil had said or raised a situation that caused concern or doubt about the validity of what had previously been said. Such questions accounted for 6 of the 26 raised.

Those occurring less frequently were questions requiring clarification of a word meaning, a point within the teacher's question or a point made by another pupil. Asking a teacher question



Table 24

## Individual Pupil's Questions by Lesson and Kind

Pupil	No. of Questions Asked	Code for Questions	Lesson Related to
# 9	1	AQR(1)	# 19
10	2	CTQ(1), CWM(1)	# 2 & 19
11	2	CPP(1), CWM(1)	#15 & 19
12	3	CPP(1), QPP(1), CWM(1)	#15 & 19
13	3	QPP(1), QSH(2)	# 7 & 19
14	9	QSH(6), QPP(3)	#11, 15, 19
15	3	QPP(1), QSH(2)	# 7
16	3	QSH(1), CTQ(2)	#15

Note: Code translation Table 25

Table 25

## Kinds of Pupil Questions Asked, Coding and Frequency of Each

	Code	Number
Asks for clarification of		
a point within teacher's question	CTQ	3
a point made by another pupil	CPP	2
a word meaning	CWM	3
Questions		
a point made by a pupil	QPP	6
own speculation or hypothesis	QSH	11
Asks question to be repeated	AQR	1
Total		26



to be repeated was the least frequently occurring pupil question of all. "Can you repeat that?" was requested by only one pupil on one occasion throughout the five lessons analysed.

On an individual pupil participation basis however, as shown in Table 24, half the pupils did not engage in forming hypothesis or speculations and questioning them. Rather, they engaged more in asking questions that required clarification of word meanings and points made by previous pupils or the teacher. Though collectively the most frequently occurring questions were related to hypothesizing and speculating, individually, only half the pupils raised such questions. Furthermore, when these questions are considered in terms of individual pupils, they appear to be mainly the work of one pupil who asked six of the eleven questions raised. The remaining five questions were attributed to three pupils. Complete transcriptions of all questions asked by each pupil for each lesson of the five sessions analysed can be found in Appendix O.

#### Pupils' Responses to Higher-Level Questions

When pupils' responses to the higher-level questions of analysis, application, synthesis and evaluation were analysed, the overall performance in terms of the number of higher-level questions asked revealed that pupils gave more Level 3 responses than Level 4 responses. The Level 3 responses more than doubled those of Level 4 (Table 26). Level 5 responses of evaluating using criteria occurred on three occasions only, in two of the five sessions analysed. These findings parallel those of the pre and post test indicating that pupils generally responded to the higher-level questions either on an





Table 26

Experimental Group's Overall Performance on Selected Lessons

Lesson	No. of High-Level Questions	Responses to Higher- Level Questions			Responses to all Questions
		Level 3 Responses	Level 4 Responses	Level 5 Responses	NFQ Responses
# 2	7	22	5		
7	8	28	11		5
11	12	39	9	2	1
15	13	55	34	1	5
19	6	38	27		6
Total	46	182	86	3	17



interpretive, applying or illustrating level or by hypothesizing or theorizing. However, NFQ responses rarely occurred in the discussion sessions in response to the higher-level questions as compared with the pre and post test findings, Table 26.

In addition to responding at a particular level according to the Ohio Scales, pupils also gave responses that showed differences in the degree of complexity of their thinking within each level. As can be seen in Table 27 pupils, overall, gave over three times as many unsupported interpretive type responses as compared with those that were supported with information from the story for Level 3, i.e. 142 unsupported responses as compared with 40 supported responses. None of their Level 3 responses however, showed a high degree of complexity. Such a discrepancy was not found however within the overall Level 4 responses. Pupils hypothesized or theorized with information from the story to support their thinking slightly more frequently than they gave responses without support when the average and high degree of complexity categories are combined. This results in 44 supported responses as compared with 42 unsupported responses. Samples of pupils' supported and unsupported Level 3 and Level 4 responses can be found in Appendix N.

Evaluating using criteria for judging, that is, Level 5 responses, was almost non-existent throughout all five sessions studied. Because such responses occurred in three instances only, all of which showed an average degree of complexity, no comparisons could be made with respect to differences in the degree-of-complexity in the judgements made. Two of the three evaluative responses made by



Table 27  
Responses of the Experimental Group to Higher Level Questions  
of the Selected Story Discussions

Lesson	No. of High- Level Questions Asked	Number of Pupil Responses												Total Responses at Levels 3,4&5	Average Response Fre- quency per Question	Average Lev. 3 Response Freq. per Question	Average Lev. 4 Response Freq. per Question
		Level 3			Level 4			Level 5			Total L	A	H				
		Com- plexity			Com- plexity			Com- plexity									
		L	A	H	L	A	H	L	A	H							
# 2	7	15	7	22	1	4	5						27	3.8	3.1	.7	
7	8	21	7	28	2	8	11						39	4.9	3.5	1.4	
11	12	24	15	39	5	4	9	2				2	50	4.2	3.3	.8	
15	13	49	6	55	22	9	34	1				1	90	6.9	4.2	2.6	
19	6	33	5	38	12	15	27						65	10.8	6.3	4.5	
Totals	46	142	40	182	42	40	86	3				3	271				



pupils can be found in the lesson transcript of Appendix Q.

When lesson-by-lesson progression was considered, there appeared to be a steady increase in the frequency of combined responses of Levels 3, 4 and 5 per question asked, for all lessons except Lesson #11 where there occurred a slight decline in responses from Lesson #7. Otherwise, the combined per-question-ratio of responses ranged progressively from 3.8 for Lesson #2 to 10.8 for Lesson #19 (Table 27). This same progression is noted when Level 3 responses and Level 4 responses were considered separately in terms of the number of higher-level questions asked per session. Level 3 responses occurred more frequently than Level 4 responses per session with an average response per question range of 3.1 to 6.3 as compared with a range of .7 to 4.5 for Level 4 responses. Though the frequency in occurrence of Level 3 responses is higher than that for Level 4 it should be noted from these ranges that the spread is approximately equal for both. The range in Level 3 responses gives a spread of 3.2. The range in Level 4 responses gives a spread of 3.8.

It can be stated that pupils of the experimental group performed in a manner similar to that indicated by the pre and post test analysis. Overall, they gave more Level 3 responses than Level 4, and evaluative responses occurred infrequently as compared to being nonexistent on the pre and post tests. Unlike the pre and post test performance, NFQ responses rarely occurred. When each level of response was studied separately, the unsupported interpretive response of Level 3 tripled the supported Level 3 responses. Supported Level 4 responses however, slightly surpassed the unsupported Level 4





responses. A lesson-by-lesson comparison indicated a general overall increase in the ratio of Level 3 and 4 responses per question as pupils progressed through the sessions.

#### Assisted and Unassisted Level 3, 4 and 5 Responses

The frequency of responses assisted by a questioning technique of lowering, raising or expanding on the part of the teacher, and those responses that were unassisted are presented in Tables 28 and 29. These findings will be reported in terms of: (a) overall assisted and unassisted combined Level 3, 4 and 5 responses, including within and between lesson comparisons, and (b) Assisted and unassisted responses within each of the three levels, including within and between lesson comparisons.

In terms of combined responses of Levels 3, 4 and 5, Table 28 indicates that pupils made slightly more 'assisted' responses than 'unassisted'—a frequency of 139 assisted Level 3, 4 and 5 responses as compared with 132 unassisted responses. These findings however, become more meaningful when viewed in terms of within lesson and lesson-by-lesson comparisons.

In order to gain a more meaningful perspective of the pupils' performance from one session to the next, responses were expressed in relation to the number of higher-level questions asked per lesson. Comparison of the frequency of the combined Level 3, 4 and 5 responses per question for each lesson (Table 28) reveals that, for three of the five lessons studied, a larger frequency of assisted responses was given within these lessons than unassisted responses. However when between-lesson comparisons were made of these frequencies, while no



Table 28

Assisted and Unassisted Responses Showing Frequency Per Level and Degree-of-Complexity,  
and Overall Frequencies Per Lesson and Question

Assisted Responses														
Lesson	No. of High-Level Questions Asked	Number of Responses												Average Responses per Question
		Level 3			Level 4			Level 5			Total Responses Levels 3,4 & 5			
		L	A	H	Total	L	A	H	Total	L	A	H	Total	
		# 2	7	14	7	21	1	2		3				
7	8	10	2	12		2		2				14	1.8	
11	12	19	7	26	2	1		3				29	2.4	
15	13	31	2	33	10	6		16				49	3.8	
19	6	12	3	15	5	3		8				23	3.8	
Totals	46	86	21	107	18	14		32				139		



Table 28 (continued)

Unassisted Responses													
Lesson	No. of High-Level Questions Asked	Number of Responses											
		Level 3			Level 4			Level 5			Total Responses Levels 3, 4 & 5		
		L	A	H	Total	L	A	H	Total	L	A	H	Total
# 2	7	1			1		2		2				3
7	8	11	5		16	2	6	1	9				25
11	12	5	8		13	3	3		6		2		21
15	13	18	4		22	12	3	3	18		1		41
19	6	21	2		23	7	12		19				42
Totals	46	56	19		75	24	26	4	54		3		132

Average Responses per Question





Table 29  
Frequency of Assisted and Unassisted Level 3, 4 and 5 Responses  
Per Lesson and Per Question

Lesson	No. of High-Level Questions Asked	Assisted Responses					
		Total Level 3 Responses	Average Frequency Level 3 Responses	Total Level 4 Responses	Average Frequency Level 4 Responses	Total Level 5 Responses	Average Frequency Level 5 Responses
# 2	7	21	3.0	3	.4		
7	8	12	1.5	2	.3		
11	12	26	2.2	3	.3		
15	13	33	2.5	16	1.2		
19	6	15	2.5	8	1.3		



Table 29 (continued)

Lesson	No. of High-Level Questions Asked	Unassisted Responses					
		Total Level 3 Responses	Average Frequency Level 3 Responses	Total Level 4 Responses	Average Frequency Level 4 Responses	Total Level 5 Responses	Average Frequency Level 5 Responses
# 2	7	1	.1	2	.3		
7	8	16	2.0	9	1.1		
11	12	13	1.1	6	.5	2	.2
15	13	22	1.7	18	1.4	1	.1
19	6	23	3.8	19	3.2		



particular pattern of increases or decreases in the frequency of assisted responses was evident, a definite pattern of increases in the frequency of unassisted responses was evident. While the assisted responses dropped and rose in frequency from Lesson #2 throughout the remaining four lessons, the unassisted responses showed an increase in frequency from Lesson #2. Though this increase was not continuous from lesson-to-lesson for all five lessons, it was continuous for four of the five sessions—Lessons #2, 7, 15 and 19. The average response frequency per question for these lessons ranged from .4 to 7.0.

A slightly different perspective is gained when the assisted and unassisted responses are considered within each response level. In terms of the overall performance pupils gave many more Level 3 responses than Level 4; and more Level 4 than Level 5 responses, as noted in Table 28. Furthermore, pupils gave more assisted Level 3 responses than unassisted Level 3 responses, but at Levels 4 and 5, they gave more unassisted responses than assisted responses. When the ratio of assisted responses and unassisted responses per question is considered as in Table 29 these general findings are maintained. A comparison of unassisted Level 3 responses with assisted Level 3 responses within each lesson indicates that the unassisted responses surpassed the assisted responses for Lesson #7 and #19 only. The remaining three lessons each demonstrated a higher frequency of assisted Level 3 responses. Comparison of the responses of Level 4 however, indicates that beyond Lesson #2 the average frequency of unassisted responses per question asked surpassed the assisted responses in each of the remaining lessons. In addition to an increase



in the unassisted responses within this level, it is noted in Table 28 that pupils tended to show an increase in the complexity of the Level 4 responses they gave.

Level 5 responses however, occurred rarely throughout all five lessons. Evidence of pupils having made an evaluation was found in three instances only which occurred in two lessons. All three responses were unassisted.

A lesson-by-lesson comparison within each level was undertaken to note any tendency such as a decrease in assisted responses while unassisted responses increased. No such pattern was observed within Level 3 or Level 4 responses. Because Level 5 responses occurred so infrequently and only as unassisted responses, no such comparison could be made. Comparison of the frequency of unassisted Level 3 responses from one lesson to the next however, showed a continuous increase in the frequency for four of the five sessions analysed, #2, 11, 15 and 19. This same frequency increase was observed for the unassisted Level 4 responses. Although Lesson #7 showed an increase in the frequency of unassisted Level 3 and 4 responses from Lesson #2, this frequency did not form part of the continuous pattern. However it can be said that pupils generally showed an increase in the frequency of Level 3 and Level 4 unassisted responses as they progressed from one lesson to the next.

In summary, then, pupils gave more assisted combined Level 3, 4 and 5 responses than unassisted responses, of which the assisted Level 3 response was the most frequently occurring. Within Level 4 pupils gave more unassisted responses than assisted, and showed





improvement in the frequency and complexity of these responses throughout the lessons studied. Level 5 responses, however, occurred only on three occasions throughout all five lessons. These responses were each unassisted. In terms of pupils' progress from lesson-to-lesson there was, generally, an increased frequency of unassisted Level 3 and Level 4 responses. Though this frequency increase was not in a continuous pattern for all five sessions studied, it was continuous for four of the five, thus indicating a general increase in the frequency of unassisted Level 3 and 4 responses as pupils progressed from lesson-to-lesson.



## Chapter VI

### SUMMARY, DISCUSSION OF FINDINGS, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

This concluding chapter of the exploratory study has six main sections. The first of these presents the study in summary form. The second is devoted to a reiteration of the questions asked, findings related to each and a discussion of these findings. A summary observation and general conclusions derived from the findings are presented in a third and fourth section. Limitations are present in section five followed by implications of the findings for educational practice and suggestions for future research in the remaining two sections. A concluding statement ends the chapter.

#### SUMMARY OF THE STUDY

The present study was exploratory in nature and designed to investigate the effectiveness of a questioning strategy in assisting pupils, classified as low reading comprehenders, in developing thinking in response to analysis, application, synthesis and evaluation questions.

For this purpose a specific questioning strategy was devised by the researcher and implemented in conducting twenty daily discussion sessions with an experimental group of eight fifth-grade pupils. This group was reduced to seven during the last week of the discussions. The discussions during the twenty sessions related to story selections taken from commercial reading and language texts



texts designed for use in the elementary grades. A control group of eight pupils matched with the experimental group on the basis of grade, sex, age, intelligence and reading ability, received daily instruction in Integrated Language Arts Skills. All verbal interaction within both groups was tape recorded during each session. Only the lessons of the experimental group however, were later transcribed and a selected number analysed.

In order to assess pupils' performance before and after the implementation of the questioning strategy, a pretest and a posttest, each comparable in form and similar in nature to the questioning strategy used during discussion periods with the experimental group, were constructed. These were administered individually, in oral form to all pupils of the control and experimental groups—the pretest prior to the initial lesson of the daily sessions and the posttest following the completion of these sessions. All pupils' responses were tape recorded and transcribed.

All verbatim responses of the pre and post tests were qualitatively and quantitatively analysed. Each response was categorized according to levels as set out by the Ohio Scales II and further classified as to its appropriateness to the question asked. Responses occurring at Levels 3, 4 and 5 of the scales were also classified according to the degree of complexity indicated in the response. The frequency of responses occurring within each of the five levels of the scales was then compared in a pre and post test within-group and between-group comparison. Individual pupil progress was calculated for pupils of the experimental group and of the control





group, and compared. In addition, a study was made of the type of responses pupils generally gave to the analysis, synthesis and evaluation questions asked, and comparison was made of pre and post test performances for indications of changes in response levels between these tests.

In order to determine progress made throughout the discussion sessions, five selected lesson transcripts were analysed in a similar manner as the pre and post test transcripts. In addition to all pupil responses being categorized by level, appropriateness and complexity, however, all teacher questions and statements were classified by the Ohio Scales I as to kind or type. Furthermore, function techniques of lowering, expanding and raising employed by the teacher were identified. The following series of comparisons were then made:

(1) pupil participation versus teacher participation (2) pupil response to peers versus pupil responses to teacher; (3) pupil initiated questions versus pupils' responses to teacher's questions; (4) pupils' responses to higher-level questions at Level 3, 4 and 5 within and between lessons and (5) pupils' unassisted Level 3, 4 and 5 responses to higher-level questions versus pupils' assisted Level 3, 4 and 5 responses to higher-level questions, within and between lessons.

#### THE RESEARCH QUESTIONS, FINDINGS AND DISCUSSIONS

Findings of this study are presented and discussed in terms of their relationship to the questions asked.



### Question 1

Can pupils classified by this study as low reading comprehenders be assisted through the use of a questioning strategy in developing thinking related to questions of analysis, synthesis and evaluation. That is, will there be an observable difference in pupil performance on a posttest from a pretest in terms of:

(a) the instances of progression from a lower level of thinking to a higher level of thinking on paired questions of the pre and post tests by pupils of the experimental groups as compared with those made by pupils of the control group for all analysis, synthesis and evaluation questions asked?

(b) the instances of pupils progressing from a lower degree-of-complexity to a higher degree-of-complexity when their responses to paired questions of the pre and post tests remain within the same level by pupils of the experimental group as compared with those made by pupils of the control group for all analysis, synthesis and evaluation questions?

(c) the frequency of pupils' responses at Levels 3, 4 and 5 of the Ohio Scales II for the analysis, synthesis and evaluation questions asked?

### Findings

Overall progress made by the experimental group in progressing from a lower level of thinking to a higher level surpassed that of the control group in a ratio of 2.7 to 1.0 instances per pupil in a pre-post test comparison. These instances of progression became more meaningful when the individual performance of pupils within both groups was considered. While both the experimental and the control groups had an equal number of pupils making progress in two instances, the majority of pupils within the control group made progress below two points or instances. The majority of pupils within the experimental group however, demonstrated progress above two points. Gains for these pupils fell within 3 and 4 points as compared with 0 and 1 points for the majority of pupils of the control group. In a more



concise form, six of the eight pupils of the control group made progress in one instance or less each, as compared with four of the seven pupils of the experimental group who made progress in three or four instances each. These findings become even more significant when Tables 8 and 17 are studied in which the progress made by the control group in Table 8 (p. 154) is not reflected in Table 17 (p. 171). This suppression of progress is attributed to regressions made by certain other pupils of this group who responded to certain questions on the posttest at a lower level than on the pretest, or gave an inappropriate response on the posttest.

When degree-of-complexity progress was considered within response levels 3 and 4, however, there was less evidence of progress made by both groups. The overall difference between the experimental group and the control group was a two point gain made by one pupil of the experimental group.

When responses to individual question types were analysed results indicated that a large proportion of pupil responses to the analysis, synthesis and evaluation questions fell below Level 3 of the Ohio Scales II on the pre and post tests. Factual, literal and "I don't know" responses, and responses not appropriate to the question asked, were common to both groups. The analysis questions elicited such responses 59 percent and 43 percent of the time for the experimental group on the pre and post tests, respectively. The control group gave such responses at a higher frequency of 61 and 64 percent, respectively. Interpreting and applying responses of a low degree of complexity within Level 3 rated second highest while Level 4





responses of theorizing and hypothesizing occurred least frequently for both groups. The experimental group however, made greater overall progress in that there was a decrease in below Level 3 responses from the pretest to the posttest while at the same time there was a 16 percent increase in their Level 4 responses. The control group meanwhile contributed a larger number of below Level 3 responses on the posttest than the pretest, and demonstrated approximately the same performance at Level 3 and Level 4 on both tests. Difficulties in extrapolating or diverging from the material while giving evidence of an awareness of relationships between component parts were observed in the performance of the experimental and the control group. Furthermore, NFQ responses and "I don't know" responses to the analysis questions occurred at a high frequency in both groups.

The synthesis questions, though asked less frequently than analysis questions, generally elicited below Level 3 responses of "I don't know," factual responses and random responses for the control group. The experimental group tended to respond below Level 3 and at Level 3 with equal frequency. This group however, showed a greater tendency to theorize and hypothesize at Level 4, with an average degree of complexity, and gave fewer random responses on the posttest than the pretest. This progression was not observed within the control group who performed identically on the pretest and the posttest except for improvement in the quality of their Level 4 responses on the posttest. Though the number of responses occurring within any one level was small due to the limited number of synthesis questions asked, an observable progression in terms of a decrease at the lower





levels and an increase at Level 4, as well as an increase in the complexity of thinking at this level, occurred within the experimental group.

The evaluation questions meanwhile, failed to elicit evaluative responses from the pupils. No pupils of the experimental group gave evidence of evaluating using a criterion on either the pre or the post tests. Only one pupil of the control group on one occasion in the posttest made a simple evaluation at Level 5 showing he had used a definite criterion in his judgement. Generally, pupils gave factual support for a decision or choice they had made but did not actually evaluate. Overall, 100 percent of the experimental group's responses to the evaluation questions asked were at the factual, interpretive - applying or hypothesizing - theorizing levels. For the control group it was 100 percent and 94 percent respectively on the pre and post tests.

In responding to the higher-level questions of the pre and post tests, NFQ responses comprised approximately one-quarter of all responses of the experimental group, and one-third the responses of the control group. Missing the specific point of the question asked and thus giving an inappropriate response was the most frequently occurring error for pupils of both groups.

### Discussion

The findings of this study indicate that in a general way the use of a questioning strategy assisted low reading comprehenders in thinking about higher-level questions. The fact that considerably greater gains were made by individual pupils of the experimental group



over members of the control group in moving upwards from a lower level response suggests that these pupils improved their thinking over a four week period in responding to analysis, synthesis and evaluation questions. The fact that some gains were also made by the control group as well as the experimental group, however, indicates the uncontrollable variables or educational factors that affect pupils' performance in a study such as this. Factors such as the small group setting, the instructor, the intermixing of pupils from different classes, and the lessons presented, all of which were different from the regular classroom routine, may have contributed to these gains.

When the degree of complexity in pupils' responses was considered within each level, there was less evidence of progress made by both groups. The overall difference between the experimental and the control groups was a two-point gain made by one pupils of the experimental group. This result was interpreted to indicate only marginal progress by the experimental group over the control group in terms of progressing to a more complex or sophisticated degree of thinking within a particular level.

In spite of the overall progress made by the experimental group, the questioning strategy appears to have been less effective when particular kinds of questions are considered. The high frequency of NFQ and "I don't know" responses of both groups to the analysis question, and the fact that the combined below Level 3 and Level 3 responses of the experimental group surpassed their Level 4 responses, suggests that there was much confusion on the part of these pupils in terms of how to answer such questions. While pupils of the



experimental group improved in the quality and level of their responses to the synthesis question as indicated by the posttest, it must be observed that the combined below Level 3 and Level 3 unsupported responses, also surpassed the Level 4 responses. This suggests that for certain pupils of this group, the synthesis question also posed some difficulty which was not assisted by the questioning strategy. Certain other pupils however, did make considerable improvement in the quality of their theorizing and hypothesizing as an apparent consequence of the treatment. The evaluation question, however, proved to be the most difficult for all pupils involved in the study. For various undisclosed reasons, these pupils appeared unable to evaluate and furthermore, a questioning strategy as investigated in this study did not assist them in thinking at the evaluative level.

The high frequency of NFQ responses to questions asked on the pre and post tests was probably one of the most alarming revelations of this study. The fact that responses that did not fit the question asked contributed approximately one quarter of all pupil responses on the pre and post tests for the experimental group, and approximately one third of the total responses of the control group on these tests, leads the researcher to conclude that the response a pupil gives is dependent upon factors other than the level at which he is capable of thinking. Missing the specific point of the question asked and thus giving an inappropriate response appeared to be by far the most frequently occurring error for pupils of both groups. Pupils frequently cued in to the first part of the question and/or the last part but did not note or relate the specific point(s) between these





parts.

Such misinterpreting of the questions asked could be argued to be a factor of the oral presentation. Each question was read twice, however, slowly, and with intonation that stressed the specific point of the question. Since pupils could have the questions repeated for them and frequently requested so, the misinterpreting appears to be related more to a lack of ability in interpreting the question. From these findings it is concluded that pupils of this study required assistance in comprehending particular kinds of questions.

It seems fair to conclude further that responding to questions is a complex process affected by the pupil's ability to handle the semantics of the phrasing. This further supports the researcher's conclusion that such pupils as those of this study require assistance in comprehending exactly what the question asks and instruction in how to answer various kinds of questions.

## Question 2

When considering the verbal interactions of selected small group discussions of stories directed by a questioning strategy:

- (a) Is there a higher frequency of teacher questions and statements to pupil responses?
- (b) Is there a greater percentage of pupil responses to other pupils' statements or questions than pupil responses to the teacher's questions and statements?
- (c) Do pupils themselves initiate questions? If so, what proportion of their total verbalizations involves questioning and what kinds of questions do they ask?

## Findings

The implementation of a questioning strategy such as that employed in this study revealed that pupils participated more



frequently than the teacher. This trend occurred in the overall performance for all five discussion sessions analysed as well as for each individual session. An increase in the frequency of pupil participation from only slightly greater than a one-to-one relationship between the teacher's questions and the pupils' responses of the initial lesson studied, to a proportionately greater participation in the following lessons, was observed. Pupil participation however did not increase progressively from one lesson to the next, but either remained the same beyond Lesson #7 or fluctuated at a slightly lower frequency.

The findings revealed however, that though pupils spoke more frequently than the teacher, their responses were generally related to the teacher's questions or comments. Eighty-six percent of their overall participation was in response to the teacher rather than to their peers. Pupils however, increased in responding to their peers as they progressed through the sessions, particularly between Lessons #2 and #7 where responses to their peers increased from one percent to 14 percent. Only slight increases were made beyond this lesson, however.

In terms of initiating questions, however, pupils did so infrequently. Ninety-seven percent of their participation did not involve asking questions. The proportion of pupil questions increased slightly and progressively from 1 to 4 percent throughout Lesson #2 and #15, to yield an overall performance of 3 percent questioning activity.

On an individual pupil performance basis, only one pupil gave



evidence of participating through questioning in a series of lessons. All other pupils demonstrated sporadic questioning that occurred once or twice in one or two lessons.

Of the 26 questions initiated by pupils the largest proportion of these were questions in which pupils questioned a hypothesis or speculation they had made. These were questions of "Well suppose . . . what would happen then?" Questioning a point made by a previous pupil, in a manner that indicated disagreement with or doubt about the statement he had made, was the second most frequently occurring question asked. Questions requiring clarification of a word meaning, a point within the teacher's question or a point made by another pupil occurred less frequently. Asking the teacher to repeat a question was the least frequently occurring question and occurred on one occasion only. Most of the pupils on an individual basis however, engaged in asking questions that involved clarification, though collectively the most frequent question was related to hypothesizing and speculating. Questioning a hypothesis or speculation was basically the work of one pupil who raised 6 of the 11 questions of this kind asked.

### Discussion

The questioning strategy implemented within the present study appears to have had a positive effect upon pupil participation in that pupils participated more frequently than the teacher. A process of learning to participate however appears evident. The finding that pupils increased in their frequency of responding from slightly greater than a one-to-one relationship between the teacher and the





pupils in the initial lesson to much higher frequencies in the following lessons might be interpreted as indicating that as pupils gained experience with the discussion techniques, they increased their participation. However, participation does not appear to have depended solely upon gaining experience. The fact that pupil participation did not increase progressively from one lesson to the next and remained either the same beyond Lesson #7 or fluctuated to a slightly lower frequency, is interpreted as indicating other factors that influenced pupil participation. The controls that the teacher either consciously or unconsciously implemented when dealing with a particular response were observed as affecting pupil participation. When it was necessary to implement expanding, clarifying, refocusing, lowering or raising techniques to develop a response into a more appropriate or acceptable response, this automatically increased the one-to-one relationship between a particular pupil and the teacher. While an attempt was being made to develop the thinking of this particular pupil, and the teacher and pupil engaged in a verbal exchange, the opportunity for other pupils to respond was sometimes lessened.

Story content and concepts being discussed also appeared to influence the depth of pupil participation in that pupils appeared to contribute a variety of ideas more easily and with less teacher interference when dealing with familiar experiences. This was particularly obvious during the discussion of the story "Gulliver the Great" where adult experiences and perceptions were discussed. For example, in discussing the question of things in Mr. Dyer's normal life that were meaningless while he floated alone on a raft in the





stormy Pacific Ocean after a disaster at sea, the following verbal exchanges were given.

P12 Everything's meaningless to him now.

P16 Like—if his wife was pregnant that would be meaningful.

T. How?

P16 It would because ah it would be an importance that would make him want more and more (pause).

T. Yes, it would be important to him W\_\_\_ but do you think it would have the same meaning for him at this moment?

P13 Yeaw, his family!

P16 Yeaw your family!

P11 They're safe at home! Yourself comes first.

T. Why would you worry about your family if they're safe at home and you're in danger?

P13 Say he just gave up out there and then he said well, I'm going to die anyway (pause) so—might as well worry about them and not worry about himself.

P16 His family I think is more important to him because he ah as long as his family's safe it doesn't really matter to him if he lives or dies.

T. How do you know that W\_\_\_?

P16 Well, that's how most people feel as long as they know their family's going to be safe.

Pupils were generally unable to fathom the reality of the experience for Mr. Dyer and hence dealt more with idealistic beliefs or impressions.



The factor of pupils' awareness of concepts and terms as influencing their performance was also observed when asking certain kinds of questions, particularly analysis questions that required pupils to give qualities. This term "quality" appeared to be a concept certain pupils were very unfamiliar with and had great difficulty abstracting from the factual material that demonstrated it. It was not difficult generally for them to quote an act that demonstrated a quality, but there was great difficulty in classifying this act within a quality term. This is apparent in the following excerpt.

Q. What qualities did Mr. Dyer have that made him able to survive such a disaster?

P15 Like just before he cut the rope off the raft he took along a casket and a tin of something.

P13 A tin of biscuits.

P15 Yeaw, a tin of biscuits and also Gulliver also helped him, that's another quality.

T. Alright Do \_\_\_, let's go back to what you said—he took things he needed like the casket of water and the tin of biscuits. What quality does that show in him?

P15 Memory.

P16 Not quite memory.

T. Can you think of a word or words that his action shows.

P16 Well, well it shows he's smart—he can remember what he should do before he leaves the boat or gets on the raft.

P9 He wanted to find some food so he could stay alive on the raft.



T. What quality does that show?

P9 He just doesn't rush on the raft right away and load off.

T. What does he do?

P9 He looks around first to see if there's any food to survive on?

P10 Yeaw, before the storm, he knew there was going to be a storm so he got ready for it like, I think he tied those tin of biscuits on and the casket so he won't lose them.

T. Yes. What is he taking then when he does that?

P15 Food.

P13 Precaution.

P11 He takes precaution.

T. What does to take precaution mean?

P13 Like you take care and stuff so nothing won't happen.

T. Alright then, his action shows precaution. We can say then he's a cautious man, which is another quality.

P15 Like when ah I don't know—I think he ah—when he swam to the raft, that's a quality.

T. Are you telling us an instance of something that happened Do\_\_\_ or a quality?

P15 A quality.

T. Do you understand what a quality is Do\_\_\_.

P15 No, not really.

T. O.K. then Do\_\_\_ a quality is a special trait or skill that somebody has which we see by the things they do. Like somebody can be clever or smart. We know that probably





by the fact they get maybe 100 in arithmetic all the time.  
 Or, like G\_\_\_ said Mr. Dyer always took precautions, he was cautious. We saw that by the fact he took biscuits and water with him on the raft. So, it's not what they do that's the quality (interrupted).

P11 No like he was precautious that's a quality.

P15 Oh—well then he's a good swimmer—that's a quality that saved him.

Responses of this kind might be explained from two viewpoints. One is to assume that such classification involved abstract thinking at a more complex thought process than these pupils were capable of. The other is to assume that the actual process of classifying an act within a term was one with which these pupils had little or no experience. From the sample excerpts the latter appears to be more likely the case. Nonetheless, there appeared to be a direct relationship between the pupil's facility in responding to such questions and his participation.

The nature of this present study appears to have affected the degree to which pupils responded to their peers. The finding that pupils responded to the teacher 86 percent of the time while responding to their peers 14 percent may possibly be explained in terms of both the structure of the study and the unfamiliarity of the pupils in engaging in such discussion activities. It must not be overlooked however, that these pupils over a four week period gave evidence of acquiring the habit of responding to their peers.

In proportion to pupils' total verbalizations per lesson and



for all combined lessons, it seems accurate to state that pupils within this study rarely asked questions. Although the pupils' questioning activity increased progressively from one percent to four percent from Lesson #2 to Lesson #15, this increase cannot be considered as indicating major progress in questioning. However, it is recognized as positive progress though slight. When the quality of the pupils' questions is considered it might best be described as being of a low caliber. Pupils' questions generally related to aspects of clarification of word meanings and points made by other pupils or the teacher, although one or two pupils gave evidence of raising hypotheses and questioning them in a "what then" manner. These pupils however were unable to pursue their own hypothesizing or imaginings when questioned further. It seems apparent to this researcher that these pupils require assistance in learning to ask intelligent, inquisitive and content related questions that relate their present and past experiences with those about which they read.

### Question 3

What changes occurred in pupil responses over a one month period? That is, as pupils of the experimental group progressed from one selected lesson to another were there observable increases in:

(a) The frequency of pupils' responses at Levels 3, 4 and 5 of the Ohio Scales II to analysis, application, synthesis and evaluation questions?

(b) The frequency of unassisted Level 3, 4 and 5 responses that occurred immediately following the posing of a higher-level question that did not require lowering, expanding or raising techniques on the part of the teacher?

(c) The frequency of questions raised by pupils?

(d) The frequency of pupils responding to other pupils in either a question or statement?



## Findings

A lesson-by-lesson comparison of pupils' responses to the higher-level questions of analysis, application, synthesis and evaluation revealed a steady increase in the frequency of combined responses of Levels 3, 4 and 5 for all lessons except one. The combined per question ratio of responses ranged progressively from 3.8 for Lesson #2 to 10.8 for Lesson #19. This same trend was noted for Level 3 and Level 4 responses when each level was considered separately. The average response per question ranged from 3.1 to 6.3 for Level 3 and .7 to 4.5 for Level 4. In terms of response quality, 142 of the Level 3 responses were unsupported as compared with 42 supported responses (Table 27, p. 197). Within the Level 4 responses however, 42 were unsupported as compared with 44 supported responses. The trend identified in Level 3 and 4 responses did not occur with evaluative or Level 5 responses since pupils gave an evaluation on three occasions only in two discussion sessions. Thus, increases in the frequency of Level 3 responses and Level 4 responses, and slight gains in the supported responses of Level 4 were observed. NFQ responses rarely occurred in the discussion sessions.

In terms of 'assisted' and 'unassisted' Level 3, 4 and 5 responses, pupils gave more assisted responses than unassisted. However, when change over time was considered in lesson-by-lesson comparisons a pattern of continuous increases in the frequency of unassisted responses within these levels was observed for four of the five sessions studied, and an overall increase from Lesson #2 to Lesson #19. This progress becomes more significant in comparing the





final lesson analysed, #19, where combined unassisted Level 3, 4 and 5 responses surpassed the assisted responses at an average response ratio per question of 7.0 as compared with 3.8. No such pattern was observed in the frequency of assisted responses. These responses lessened within certain lessons and increased slightly within others.

As already discussed within Question 2, questions raised by pupils contributed 3 percent of their total verbalizations. Slight progress between lessons in the frequency of their questioning activity was observed in a one to 4 percent increase between Lesson #2 and #15. The frequency however, dropped by one percent for the remaining lessons analysed. A positive though slight change did occur over time but this change was not one of consistent increase from lesson to lesson. Rather an initial 3 percent increase in the frequency of questions was generally maintained throughout the remaining lessons except for a 4 percent increase occurring within one lesson only.

As pupils progressed from one lesson to the next they increased in responding to their peers from one percent within Lesson #2 to 14 percent within Lesson #7. For the remaining lessons the percentage of responses to peers fluctuated from 12 percent to 18 percent, to give an overall 14 percent pupil-pupil interaction for the five sessions studied. Instances of pupils responding to the teacher for these five sessions decreased from 99 percent in Lesson #2 to 84 percent in Lesson #19 giving an overall 86 percent of pupil responses to the teacher.





## Discussion

In considering the frequency of Level 3 responses given by pupils during the discussion sessions it appears that these pupils found it very easy to give unsupported interpreting, applying and illustrating responses. A point of query to this researcher is the extent to which such performance reflects established habits and practices that these pupils have grown accustomed to during their years of formal schooling. Furthermore, a questioning strategy such as implemented within this study appears not to have altered this apparent practice.

Difficulties encountered on the pre and post tests in responding to evaluation questions were also reflected in the group discussions. Pupil responses to these questions generally reflected a lack of awareness of establishing criteria for evaluating and applying those criteria in making a decision or judgement. Because the discussion sessions were not geared toward teaching particular techniques in answering questions, it is not surprising that pupils who had not previously acquired the skill of evaluating did not acquire this skill through the implementation of a questioning strategy.

Is it to be assumed however that because pupils did not evaluate that they did not have the ability to do so, that is their thinking processes had not sufficiently developed to the stage where they could engage in such operations. If Piaget's (1963) stages of development are taken literally, it would be assumed that the ten year olds may not have developed to this particular stage of formal thinking, while the eleven year olds may be assumed to have reached



this stage in thinking. This is a possible explanation, which would explain not only the pupils' performance in relationship to evaluation questions, but also their high frequency of below Level 3 responses and NFQ responses to the analysis and synthesis questions on the pre and post tests. Furthermore, the developmental nature of Piaget's theory would explain the general lack of complexity in the Level 3 and Level 4 responses to the analysis questions, but not the increase in complexity of the Level 4 responses to synthesis questions. This feature demonstrates the "all manner of variables" that may affect the development of any given stage of the thinking processes identified by Piaget (Flavell, 1963, p. 20), and requires the problem to be viewed in light of training and experience.

Taba et al. (1964) produces evidence from their studies of pupils' thinking to substantiate the hypothesis that "an adequate emphasis on concrete operations of thought is a necessary prerequisite for the emergence of formal thought" (p. 175). In a later study Taba (1967) supports in a general way that the use of specific teaching strategies made a difference in the productivity of pupils' thinking as well as in the type of cognitive operations in which pupils engaged (p. 222). Wolf et al. (1967) supported Taba's findings particularly in the use of specific teaching skills in developing evaluative thinking within pupils. This evidence poses another possible explanation for the failure of the pupils within this study to evaluate. This relates to the teaching aspect. Is the process of evaluating a process that must be taught within the limits of specific skills which thus provides adequate experience in the



concrete operations involved, such as Wolf et al. (1967) demonstrate? Sanders (1972) stipulates that in order to evaluate one must know the rules, that is, to establish criteria for judging and then to apply these criteria to make a decision. He maintains that pupils' failure to respond to higher-level questions, including evaluation questions, does not mean that they are not capable of such thinking but experience problems in selecting functional ideas with which to work (pp. 274-275). It is with this selection that they require assistance. Since no teaching of how to answer particular kinds of questions, i.e. the teaching of particular skills, was attempted in this study, failure of pupils to make progress in responding to evaluation questions may have indeed related to this aspect. The lowering of questions or the expanding of questions cannot be considered as providing the concrete experiences of teaching specific skills necessary for evaluating. Considering pupils' performance in this manner, the researcher must conclude that the pupils of this study had not learned how to evaluate, either prior to the study or as a consequence of the treatment.

The data on growth in the frequency of pupils responding to their peers led the researcher to conclude that the implementation of a question strategy, through developing within pupils the habit of responding to their peers by an overall 14 percent, may at the same time have induced controls which inhibited greater increases in such interaction. Because the study was one of investigating the use of a questioning strategy in developing pupils' thinking, it necessarily required a key figure to direct the discussion by asking questions.





Therefore the researcher's role of group leader, questioner and 'assumed' teacher could necessarily be expected to reduce the frequency of pupils responding to their peers. Furthermore, there is the question of whether these pupils from classroom experiences were familiar with discussing collectively as a group, as opposed to contributing individually in a competitive situation. While no conclusion can be made on this latter aspect, the evidence of pupils questioning responses of their peers in tones that indicated disagreement with rather than the development of ideas, suggests a possible inability to think and contribute collectively as a group.

This study demonstrated that pupils themselves do initiate questions but in proportion to all other pupil responses, they occurred rather infrequently. A number of explanations might be given for the lack of frequency in pupils' questioning, however. The first of these lies in the possibility of the researcher who, in the view of the pupils, assumed the role of teacher and consequently was expected to ask all the questions, in spite of the fact that pupils were encouraged and instructed to ask questions in the initial session. Furthermore, there is the question of how accustomed these pupils were from classroom experiences with group discussions in asking questions. Generally, they belonged to large reading groups where participation by every pupil was near impossible. A small group setting such as within this study however, not only made it possible but to a certain degree mandatory that each pupil become actively involved. The newness of the experience for certain of these pupils may therefore have affected their performance particularly in asking



questions as opposed to answering them. This point seems to be somewhat substantiated by the fact that a three step process seemed to be evident in the lesson transcript analyses. Initially pupils appeared to concentrate upon answering questions—questions of the teacher. From this point they generally progressed somewhat to responding to pupils' responses as they apparently became more accustomed to the discussion situation. Only a very slight progression was made however, to the third step of asking questions. Was the whole experience then, one of adapting in a step-by-step fashion to a situation that was too unfamiliar for progress to be made in all aspects at the same time, thus resulting in only infrequent questions being asked? Furthermore, would greater progress in pupils' questioning activity have resulted over an extended period of at least one school year? These are points of query which arise from this study.

The structure of the study itself must also be considered as having some inhibiting factors with respect to pupils raising questions. The fact that a questioning strategy was being implemented by the researcher may have automatically reduced the opportunity for pupil questions even though pupils were encouraged to ask questions throughout. Furthermore, because certain pupils' questions on the rare occasion were left unattended or ignored for the convenience of developing a thought process already under discussion, those pupils concerned may have been discouraged in asking further questions. Since instances of this nature occurred only infrequently in certain discussions it cannot be considered a major contributing factor, however.



It is interesting to note that the NFQ response rarely occurred in the discussion sessions in response to the higher-level questions as compared with the pre and post test findings. This finding might possibly be accounted for by the differences that existed between the two settings. Because the pretest and the posttest were individual settings each pupil responded to all higher-level questions. In the discussion sessions, however, this was not the case since the interaction did not involve every pupil responding to every question. Furthermore, any pupil experiencing doubt about a question had the option of not participating in the discussion. On the pre and post tests however, he was expected to respond and did, irregardless of the kind of answer he could give.

Finally, in considering the findings related to assisted and unassisted pupil responses, no relationship could be established between the frequency of assisted and unassisted responses. This would seem to suggest that the relationship between these features is probably not a direct one. In other words, the assistance given by the teacher does not necessarily decrease as the unassisted responses increase. It appears that the frequency of assisted responses is related to the frequency and difficulty of the higher-level questions asked as well as pupils' familiarity with the content being discussed. In this study the increased participation on the part of the pupils in responding to certain questions that they appeared to have greater background experiences and facility for answering, resulted in an increase in the unassisted pupil responses. Certain other questions with which they experienced difficulty





resulted in continued assistance from the teacher.

### Summary Observations

In summary, the researcher feels it necessary to re-emphasize the following points.

An over-riding factor that must be considered in viewing the results of this study is the developmental stage of the pupils involved in terms of thinking capacity or facility. Pupils generally experienced difficulty in evaluating and analysing, particularly in expressing relationships between parts. To what extent were these results factors of stages of development? Although some of the pupils had reached age eleven and were, according to Piaget's stages of development, at the stage of formal thought, those at the upper age ten level would possibly not be assumed to be at this stage.

The question of pupil performance, however, does not appear to relate entirely to stages of development according to Taba (1967) and Wolf et al. (1967). Taba (1967) concludes from her studies previously quoted that the stages occurred earlier than Piaget outlines and that certain kinds of formal thinking are evident even at the grade two level. Wolf et al. (1967) demonstrates furthermore from instructional lessons with grades one through six that pupils can be taught the skill of critical or evaluative thinking in a step-by-step approach even at the grade one level. The question then is one of could these children learn to analyse, express relationships between component parts and evaluate using criteria, if these cognitive tasks were taught within the limits of specific skills using the same reading materials as within this study. The researcher





believes so.

Finally there is the question of time. The present study left no doubt that certain pupil behaviors in an interactive process were favorably influenced by the use of the questioning strategy, and certain aspects of the pupils' thinking showed a definite improvement and progression. However, it is equally clear that not all aspects investigated within this study were modified in the four week period of time. Thus, there is the question of the amount of time required to develop evaluative thinking for example, or questioning pupils or analytically thinking pupils. It appears that a study of this nature would necessarily have to be conducted over a period of not less than one complete school year to determine in a more accurate manner the real effectiveness of a questioning strategy in developing pupils' thinking. This present study is therefore a modest beginning to future investigation.

#### GENERAL CONCLUSIONS

On the basis of the findings of this study the following conclusions are made:

1. The questioning strategy implemented in this study assisted pupils in a general way in developing their thinking related to higher-level questions.
2. The questioning strategy was less effective in assisting pupils in answering specific kinds of questions within the analysis and evaluation levels.
3. Pupils of this study were unable to evaluate and the



questioning strategy as applied in this present study did not assist them in thinking at the evaluative level.

4. The answering of questions is a complex process that involves more than the pupil's ability to think at particular levels of a hierarchy. His experiential background and his facility in comprehending the question asked are related factors.

5. Pupils of this study appeared to require instructional assistance in understanding particular kinds of questions and instruction in specific procedural techniques for answering them.

6. The questioning strategy employed by the teacher in this study encouraged greater pupil participation than teacher participation and resulted in increased pupil participation as pupils gained experience with the discussion procedure.

7. Pupils of this study initiated questions though infrequently in terms of their overall responses. Furthermore the quality of their questions was generally of a low caliber.

8. Pupils of this study require assistance in asking intelligent, inquisitive and content related questions.

9. The study may have induced controls which to a small degree may have inhibited greater increase in pupil-pupil interaction and in pupils' questioning activity.

#### LIMITATIONS

In addition to the limitations of this study acknowledged in Chapter I, the following limitations must be considered in interpreting the findings.



1. Whereas the researcher's classification of questions and responses of the pre and post tests were judged by independent raters all on-the-spot questions and responses of the pupils during the lesson discussions were classified by the researcher only. Though a high rate of agreement occurred for the classifications of questions and responses between the raters and the researcher on the pre and post tests, it can only be assumed that equal accuracy occurred in classifying responses and on-the-spot questions of the lesson discussions.

2. A certain limitation may also have been inherent in the category definition for evaluation responses. Because this category required that the criteria used for making an evaluative decision be explicitly stated, responses that appeared to have criteria implicit in them could not be classified as evaluation. Because it was difficult to determine whether the response was actually an evaluation or a superficial response, they were generally classified as hypothesizing or theorizing within Level 4. In doing so, credit may have been denied certain pupils who in thinking through their responses used criteria but did not state this in the response.

#### IMPLICATIONS OF THIS STUDY

This study has demonstrated that the use of a questioning strategy in discussing story content is an effective tool for developing pupils' thinking as it relates to higher-level questions. The effect however is general in that in overall performance pupils of this study demonstrated instances of progression from a lower level of thinking to a higher level, as well as progress in the





quality of thinking within a particular level. These findings suggest to the classroom teacher working with small reading groups that the use of a similar questioning technique is a beneficial approach to story discussion. It not only offers direction and focus to the discussion but provides for increased group participation. Furthermore, for the novice questioner the concepts and ideas presented within this study provide direction in the designing of questioning strategies. These are also applicable to other content areas outside the realm of stories.

This study further suggests that in terms of answering specific kinds of questions such as evaluation questions and analysis questions, there appears to be, as Sanders (1966, 1972) maintains, a process that the pupil must be aware of in answering these questions. The asking of a continuous stream of questions whether at a lower, higher or expanding level than the initial question does not appear to assist him in learning the process. It seems important then for educators and teachers to consider the questions they ask in terms of the processes involved in answering them, and devise from these processes a step-by-step teaching approach that may direct pupils in organizing and developing their thinking through a sequence of clearly defined steps.

The frequency of pupils misinterpreting questions and consequently giving inappropriate responses as occurred within this study, points out the need for awareness and alertness on the part of the teacher in analysing the content of pupil responses. Since many of the pupils' inappropriate responses can go unnoticed in the verbal



exchange within a group and might not become obvious until taped and transcribed, it is both necessary and beneficial for both reading teachers and teachers of other content areas to frequently tape and transcribe or replay for study purposes such discussion sessions. In this manner he or she may be alerted to the general kinds of errors and weaknesses pupils demonstrate in answering questions. Furthermore, it becomes, as the researcher discovered, a form of professional development in which the teacher evaluates—sometimes with alarming dismay—his or her competency in questioning, particularly when responding to pupils' responses.

The frequency of instances in which pupils did not fully understand the question asked them, that is, they missed the specific point of the question, seems to indicate a need by these pupils for instruction in understanding exactly what the question asks. It is possible that poor comprehension as measured on particular reading tests within the schools for such pupils, may be a consequence of a deficit in comprehending questions. It might therefore be beneficial to the learning situation if pupils experiencing this difficulty were identified and a unit of specific instruction implemented within the language-arts program.

It has been suggested by Guszak (1967) that if we want to develop irresponsible citizens one of the ideal methods is to accept unsupported responses. Although each unsupported response was questioned and expanded in the discussion sessions, the high tendency to give unsupported responses is a point of concern for this researcher. Did such responses occur as a consequence of habit or



practice? If so, is it to be assumed that they reflected current classroom practices of accepting unsupported responses as acceptable answers? While there may be no definite answer to these questions the results of this study suggest that it is essential to impress upon the pupil the importance of substantiating his response, opinion or judgement with evidence from the material he has read. For those pupils not accustomed to doing so, specific instructional units directed toward this objective, followed by the consistent requirement that they apply the principle throughout all discussions, may prove more than worthwhile.

Finally, it was especially noticeable in tabulating pupils' responses and questions that pupils' questions occurred on rare occasions only in terms of their overall verbalizations. Furthermore, the quality of their questioning was of a low caliber generally relating to clarifying responses, teacher statements or word meanings. The ability to question other pupils' responses intelligently, to pursue hypotheses they themselves raised, and to question the story content was not evidenced. This would seem to imply that these pupils need opportunities for developing insights into questioning. Providing opportunities for them to formulate questions, to respond to other pupils' responses or comments with a question and to question reading content in terms of their own experiences might be classified as prime needs of these and similar pupils. Teaching them the process of questioning and making provision for them to ask well thought out questions would possibly be of definite benefit for such students.





## SUGGESTIONS FOR FUTURE RESEARCH

As the researcher progressed through this study, a number of relevant aspects for future research became apparent. These are as follows:

1. The present study investigated the use of a questioning strategy in developing pupils' responses to higher-level questions using story content. It did not involve the use of teaching strategies such as the teaching of procedures for answering specific higher-level questions. An interesting and worthwhile study might be to investigate the effectiveness of a teaching strategy as opposed to a questioning strategy in developing responses to these questions related to story content. Such an undertaking might involve the identifying of specific thinking processes involved in answering each specific question kind, the translating of these processes into specific skill sequences, and the teaching of these skills using the story content.

2. Results of this study indicated that many responses were given that did not fit the question asked. The implication was made of a possible relationship between the pupil's ability to comprehend questions and his performance on school selected tests of comprehension. A future study might seek to determine the relatedness between these factors.

3. During the study it was observed that certain pupils of the experimental group were very verbal as compared with certain other pupils who spoke much less frequently. No attempt was made to determine the quality of the verbal child's responses however, in





comparison with those of the less verbal child. An experiment might be conducted to determine whether there is a relationship between the verbal ability of pupils and the complexity of their responses to higher-level questions.

4. Ten and eleven year old pupils of this study generally experienced difficulty in responding to the analysis and evaluation questions in story discussions. Further studies may be conducted to determine whether ten and eleven year old pupils identical to those within this study can perform within these levels in a teaching-learning situation using similar questions and story content. Such a study might involve identifying the thinking processes required to answer particular questions within these levels, translating them into teachable skill sequences and directing pupils through the sequence.

5. Questions were presented in a verbal medium to pupils of the control and experimental groups. This did not provide opportunity for pupils to comprehend the question through reading nor did it take into account any problems the pupils may have experienced in auditorilly processing the question content. Exploring the effects of the medium of question presentation on the pupils' oral responses to test items might be of considerable value to researchers, educators and clinicians. The study might consider the effects of three media of question presentation: the oral, the oral and reading, and the reading alone.



## CONCLUDING STATEMENT

This exploratory study investigated the use of a questioning strategy in developing pupils' thinking related to higher-level questions. It is concluded that the strategy was effective in a general way in developing pupils' thinking related to such questions. Pupils demonstrated observable progress in responding from a lower level of thinking to a higher level as well as slight progress in the complexity of responses. The questioning strategy was not effective however, in developing evaluation responses.



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## APPENDICES



APPENDIX A  
STORY EVALUATION SHEET





## STORY EVALUATION SHEET

Please evaluate each story along the following criteria.

1. Subject Area

Do you feel the subject area is one with which fifth-grade students are familiar in the sense that it relates to either their actual experience or general knowledge?

Comments: \_\_\_\_\_  
\_\_\_\_\_

2. Content

Does the story content provide the opportunity for posing questions that require students to make inferences, draw conclusions, apply knowledge, analyse, synthesize and make judgements?

Comments: \_\_\_\_\_  
\_\_\_\_\_

3. Concepts and Ideas

Do you feel the concepts and ideas presented are within the students' limits of understanding and experience, yet novel enough to stimulate thinking?

Comments: \_\_\_\_\_  
\_\_\_\_\_

4. Vocabulary

Do you feel that the knowledge of word meaning required by the reader for understanding the story would generally be acquired by the fifth-grade level?

Comments: \_\_\_\_\_  
\_\_\_\_\_

5. Attitudes Fostered by the Story

Do you consider the attitudes fostered within the story (1) not related to ethical issues of a controversial nature, and (2) able to be detected as an author's point of view?

Comments: \_\_\_\_\_  
\_\_\_\_\_



APPENDIX B

GENERALIZATION STRATEGY EVALUATION SHEET



## GENERALIZATION STRATEGY EVALUATION SHEET

The following generalizations are seen by me as those most worthwhile for development from this story. They also appear conceptually sequential in that each concept is dependent upon and originates from the previous one. However, I am not certain that other teachers would agree with these points.

Please read each story and evaluate the generalizations:

1. Do you feel that the generalizations are the most worthwhile (i.e. in terms of application to real life situations) to be developed?  

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2. Do you feel the generalizations are conceptually sequential?  
If not, please comment.  

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3. Is there any additional generalization(s) you feel should be included? If so, please indicate at which level, and state the generalization.  

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4. Do you disagree with the total generalization strategy?  
If so, please comment.  

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5. Any other relevant comments?  

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## APPENDIX C

### GENERALIZATION STRATEGY FOR PRE AND POST TEST STORIES



The degree to which we overcome the handicap varies with the individual.

9.

What we learn and how we learn depends upon several factors—  
faculties lost; when lost; existing faculties; training and understanding of the handicap by qualified individuals; the determination of the handicapped.

8.

Difficulties in learning and communicating will depend upon the sensory loss: multiple sensory losses are much more difficult to cope with.

7.

We learn to communicate through other senses but certain kinds of information these 'other' senses cannot provide. There is need to develop a 'new' communication system using the existing senses.

6.

When a major sense is lost the other senses become more important.

5.

Through accident, illness or birth one or more of the main senses for communicating may be destroyed.

4.

Information is received through all five senses

-sight > most widely used  
-hearing  
-touching  
-tasting  
-smelling

Information is shared through a language system - oral, written, sign.

3.

Communicating is a two-way process - receiving and giving information.

2.

We learn through a system of communication.

1.

Theme - Learning to Overcome a Sensory Handicap



APPENDIX D

PRETEST STORY - "HOW HELEN KELLER LEARNED"



## HOW HELEN KELLER LEARNED

*Helen Keller*

*When Helen Keller was little more than a year old, a severe illness left her both blind and deaf. It is hard to imagine a more terrible affliction. Yet in spite of it she not only learned to read and speak, but acquired a college education. This selection from her book, THE STORY OF MY LIFE, will give you some idea of how she overcame some of her difficulties.*

I cannot recall what happened during the first months after my illness. I only know that I sat in my mother's lap or clung to her dress as she went about her household duties. My hands felt every object and observed every motion, and in this way I learned to know many things. Soon I felt the need of some communication with others and began to make crude signs. A shake of the head meant "No" and a nod "Yes", a pull meant "Come" and a push "Go". Was it bread that I wanted? Then I would imitate the acts of cutting the slices and buttering them. If I wanted my mother to make ice cream for dinner, I made the sign for working the freezer and shivered as if cold.

My mother, moreover, succeeded in making me understand a good deal. I always knew when she wished me to bring her something, and I would run upstairs or anywhere else she indicated. Indeed, I owe to her loving wisdom all that was bright and good in my long night.

I understood a great deal of what was going on about me. At five I learned to fold and put away the clean clothes when they were brought in from the laundry, and I distinguished my own from the rest. I knew, by the way my mother and aunt dressed, when they were going out, and I invariably begged to go with them. I was always sent for





when there was company, and when the guests took their leave, I waved my hand to them.

I do not remember when I first realized that I was different from other people, but I knew it before my teacher came to me. I had noticed that my mother and my friends did not use signs as I did when they wanted anything done, but talked with their mouths. Sometimes I stood between two persons who were conversing and touched their lips. I could not understand, and was vexed. I moved my lips, but without result. This made me so angry at times that I kicked and screamed until I was exhausted.

In those days a little colored girl, Martha Washington, the child of our cook, and Belle, an old setter and a great hunter in her day, were my constant companions. Martha Washington understood my signs, and I seldom had any difficulty in making her do just as I wished. We spent a great deal of time in the kitchen, kneading dough balls, helping make ice cream, grinding coffee, quarreling over the cake bowl, and feeding the hens and turkeys that swarmed about the kitchen steps. Many of the fowls were so tame that they would eat from my hand and let me feel them. One big gobbler snatched a tomato from me one day and ran away with it. Inspired, perhaps, by Master Gobbler's success, we carried off to the woodpile a cake which the cook had just frosted, and ate every bit of it. I was quite ill afterward, and I wondered if the turkey was too.

The most important day I remember in all my life is the one on which my teacher, Anne Mansfield Sullivan, came to me. It was the third of March, 1887, three months before I was seven years old.



From the beginning of my education, Miss Sullivan made it a practice to speak to me as she would speak to any hearing child; the only difference was that she spelled the sentences into my hand instead of speaking them. If I did not know the words necessary to express my thoughts, she supplied them, even suggesting conversation when I was unable to keep up my end of the dialogue. This process was continued for several years.

The next important step in my education was learning to read. As soon as I could spell a few words, my teacher gave me slips of cardboard on which were printed words in raised letters. I quickly learned what each printed word stood for. I had a frame in which I could arrange the words in little sentences; but before I ever put sentences in the frame, I used to make them with objects. I found the slips of paper which represented, for example, "doll", "is", "on", "bed" and placed each name on its object; then I put my doll on the bed with the words *is, on, bed* arranged beside the doll, thus making a sentence of the words and at the same time carrying out the idea of the sentence with the things themselves.

One day, Miss Sullivan tells me, I pinned the word *girl* on my pinafore and stood in the wardrobe. On the shelf I arranged the words, *is, in, wardrobe*. Nothing delighted me so much as this game. My teacher and I played it for hours at a time.

From the printed slip it was but a step to the printed book. I took my *Reader for Beginners* in raised type (Braille) and hunted for the words I knew. When I found them my joy was like that in a game of hide-and-seek. Thus I began to read.



It was in the spring of 1890 that I learned to speak. The impulse to utter sounds had always been strong within me. I used to make noises, keeping one hand on my throat while the other hand felt the movements of my lips. I was pleased with anything that made a noise and liked to feel the cat purr and the dog bark. I also liked to keep my hand on a singer's throat, or on a piano when it was being played. Before I lost my sight and hearing, I was fast learning to talk, but after my illness it was found that I had ceased to speak because I could not hear. I used to sit in my mother's lap all day long and keep my hands on her face because it amused me to feel the motions of her lips; and I moved my lips, too, although I had forgotten what talking was. My friends say that I laughed and cried naturally, and for a while I made many sounds, not because they were a means of communication, but because of the need of exercising my vocal organs. There was, however, one word the meaning of which I still remembered, *water*. I pronounced it "wa-wa". Even this became less and less intelligible until the time when Miss Sullivan began to teach me. I stopped using it only after I had learned to spell the word on my fingers.

In 1890 Mrs. Lamson, a teacher of the deaf, who had just returned from a visit to Norway and Sweden, came to see me and told me of Ragnhild Kaata, a deaf and blind girl in Norway who had been taught to speak. Mrs. Lamson had scarcely finished telling me about this girl's success before I was on fire with eagerness. I resolved that I, too, would learn to speak. I would not rest satisfied until my teacher took me, for advice and assistance, to Miss Sarah Fuller,





principal of the Horace Mann School for deaf children, in Boston. This lovely, sweet-natured lady offered to teach me herself, and we began on the twenty-sixth of March, 1890.

Miss Fuller's method was this: she passed my hand lightly over her face, and let me feel the position of her tongue and lips when she made a sound. I was eager to imitate every motion and in an hour had learned six elements of speech: M, P, A, S, T, I. Miss Fuller gave me eleven lessons in all. I shall never forget the surprise and delight I felt when I uttered my first connected sentence, "It is warm." True, they were broken and stammering syllables; but they were human speech.



APPENDIX E

POSTTEST STORY - "CHILD OF THE SILENT NIGHT"



## CHILD OF THE SILENT NIGHT

*By reading, you can learn of children and adults who have been able to overcome their handicaps and problems and find their place in the world.*

*One such person was Laura Bridgman. She was both deaf and blind as a result of a childhood illness. In 1837, a few weeks before her eighth birthday, Laura's parents took her to school to start her great adventure in learning. Dr. Howe and his sister, Miss Jeannette Howe, were her teachers.*

*The following selection ... tells of Laura's first encounter with formal schooling.*

The room that had been given to Laura was in Dr. Howe's own apartment and he and his sister quickly became another father and mother to her. In a very short time she began learning, through her hands of course, to identify every member of the school family. There were more than forty people: blind children and teachers. Laura soon knew every one of them by touch.

At the end of two weeks Laura was so happy in her new surroundings that Dr. Howe felt he could begin the experiment he had planned. The night before he began he discussed his plans aloud with his sister.

"My goal is perfectly clear to me, Jeannette," he said. "I am going to try to bring into Laura's mind the idea that there are twenty-six different signs or letters that everyone uses. This is our alphabet. I want her to know that by combining these letters into words we can share our thoughts with each other."

"But Sam, how in the world are you going to 'tell' Laura that?"



asked Miss Jeannette, puzzled....

"I know just exactly how I am going to try to do it," said Dr. Howe, smiling. "You may attend the first class with Laura tomorrow morning and see for yourself."

The great day dawned. When the first lesson began Laura was seated at a table across from Dr. Howe. Beside her sat Miss Drew, who was to be Laura's own special teacher. Miss Jeannette Howe sat watching nearby.

The doctor had arranged a row of objects on the table in front of him. There were a large key, a spoon, a knife, a fork, a book, a cup, and a few other things with which he felt sure Laura would be familiar.

First Dr. Howe put the key into Laura's hand. It was a very large key. He let her handle it and feel it all over. She knew immediately what it was. The key at home with which she locked her boot in the cupboard was very much like this one - except for one thing. Her sensitive fingers paused as they felt the long key. There was something on this one.

Dr. Howe had fastened a paper label on the key. On the label the word *key* was written in a special kind of raised lettering or embossing that was used at that time in writing for the blind. The Braille system, now so widely used, had not yet been adopted. Dr. Howe guided Laura's fingers over the raised lines of the letters several times. She had no idea, of course, what the letters were.

Then he took the key away from Laura and handed her a spoon. She took it, felt it and immediately recognized it as a spoon much like





the ones with which she set the table at home. Again there was one important difference. Along the handle of the spoon Dr. Howe had pasted a label with the letters S-P-O-O-N written in raised type. Dr. Howe guided her fingers carefully over this word several times.

Now the doctor took away the spoon and gave the key back to Laura. He directed her fingers to the label on the key again. Then he gave her back the spoon and directed her fingers to the label on the spoon once more. He wanted Laura to feel that the shape of the lines on the key label and the shape of the lines on the spoon label were just as different from each other as the key and spoon themselves were different from one another....

Now the doctor did something else. He took away the key and the spoon and gave Laura just a piece of paper with some raised letters on it. The letters were K-E-Y again. Taking the key once more, Dr. Howe directed Laura's fingers to the label on it.

An expression on Laura's face made it quite clear that she recognized that the raised letters were the same on both papers, the one on the key and the separate label. Dr. Howe went through the same process with the spoon and a separate label that read S-P-O-O-N.

The rest of that first lesson was spent letting Laura feel the remaining objects - cup, knife, book, and so forth - and the labels for these, both those pasted on the object and those that were separate. From that time on Laura had lessons every morning and afternoon. She seemed to enjoy them thoroughly and to consider them just a game, not work. It was difficult for Dr. Howe and Miss Drew to get her to stop "playing" this game.



By about the third day Dr. Howe and Miss Drew were delighted to see that Laura had grasped the important point that the separate label for *key* somehow went with the key and the label that was separate from the spoon went with the spoon. That she understood this was shown by the fact that she could take a separate label, such as the one spelling *book*, and feel about until she found a book without any label. Then she would place the label on the book.

In a very few days Laura could reverse this process. She could pick up an object, such as a spoon, search through a pile of loose labels on the table, feel them until she found the one that read S-P-O-O-N and then put it on a spoon. She could do this for any object for which she had been taught the feeling of the word.

Dr. Howe was greatly encouraged. He felt sure that he was going to succeed with Laura; his only question was how long it was going to take him. In a report that he once wrote about his work with her he said: "It sometimes occurred to me that she was like a person alone and helpless in a deep, dark, still pit,"...

The lessons were going so well that Dr. Howe felt Laura was ready to take another important step forward. He had Miss Drew cut the labels for the words *key*, *spoon*, *knife*, and so forth, into separate letters. Up until this time Laura had seen words as wholes. Now he wanted her to learn that they are made up of parts - letters. Laura was allowed to follow closely, with her hands, all that Miss Drew did. After the words had been cut into separate letters, her hands followed Miss Drew's as she arranged the letters back into words.

In an astonishingly short time Laura had grasped the point of



this new "game". If Miss Drew handed her the letters O,S,N,O,P, in a flash Laura could arrange them in the correct order to spell S-P-O-O-N. If Miss Drew gave her Y,K,E, Laura arranged them into the word K-E-Y. O,K,O,B, and I,K,E,N,F were equally simple for her. After a few more lessons Laura could do this with all the words in her vocabulary and soon after that she could take from a whole pile of loose letters whatever ones she wanted and spell correctly any word she wished of those she had been taught. This would have been a great accomplishment for any eight-year-old. How much more remarkable it was for a little girl like Laura Bridgman!...

Two months had passed before Dr. Howe felt that Laura was ready to take the final step that he had planned for her. Miss Drew was sent to the home of a Mr. George Loring, who was a deaf-mute, to learn the manual alphabet. She learned it in one afternoon.

The manual alphabet is a way of forming the twenty-six letters of the alphabet with the hands ...

A deaf person who has been "talking" with the manual alphabet for a long time can "say" with his hand as many as 130 words a minute. A deaf person who is skilled at watching another person "speak" with his hands can easily "read" 130 words a minute.

Laura, of course, would not be able to see the letters. Miss Drew would have to form them in Laura's hand so that she could feel them.

But how could she teach Laura that the various positions in which she held her fingers meant the letters of the alphabet that she had already learned... This is how Miss Drew did it. She picked up the key and let Laura feel it. Then she took the letter *k* from the set





of metal types and let Laura feel that. Then she shaped the letter *k* in the manual alphabet into Laura's hand, her first two fingers up and bent forward, the next two fingers folded down, and the thumb up. She made Laura feel the way her fingers were held. Then she let Laura feel the metal letter K again.

The same procedure was followed with the letter *e*.... Finally the letter Y was taken from the metal types and Laura allowed to feel it.... Now Miss Drew had set the metal types K-E-Y in the form. She let Laura run her hand over the whole word. Then she formed again, in the manual alphabet, the letters *k-e-y* in Laura's hand and she placed the key itself in Laura's other hand. This was done with the spoon, the cup, and the key again.

And then it happened! For two months Laura had been "playing" these games with letters and words almost the way a trained dog performs certain tricks. Now, suddenly, it was different. Dr. Howe always said that he knew almost the exact moment when Laura's face showed that she at last really understood what all this meant. Suddenly it seemed to become clear to her that every object had a name, that these names could be spelled by letters, either in raised letters, metal types or, most easily of all, by the manual alphabet.



## APPENDIX F

### ORAL DIRECTIONS FOR THE PRE AND POST TESTS



Oral Directions for Pre and Post Tests

Read the story carefully to yourself. If there is any word you do not know, raise your hand and point to the word. I will say it for you. If you want to know the meaning of the word, ask and I will give you its meaning.

When you have finished reading the story I will ask you some questions. Some of the answers will be easy because you can find them in the story. Others will be more difficult because you cannot find them directly in the story. You must think carefully about them.

If you need to reread any part of the story to give your answer you may go back and read that part.

If you need a question repeated at any time, ask and I will repeat the question.

You may take as much time as you need to give your answer. Please try to give the best answer you can think of.



## APPENDIX G

### PRETEST





Pretest: How Helen Keller Learned

- |              |  |
|--------------|--|
| (Fact)       | 1. What was Helen Keller's handicap?   |
| (Fact)       | 2. How old was she when this happened?   |
| (Fact)       | 3. Without the sense of sight and hearing how did she learn?   |
| (Inference)  | 4. What things could Helen never learn through the sense of touch?   |
| (Analysis)   | 5. Why was it important that Helen learn to communicate with people?   |
| (Analysis)   | 6. Why was it very difficult to teach Helen to communicate?  |
| (Analysis)   | 7. In the story you just read, Helen spoke about her life as 'the long night'. What did she mean?  |
| (Synthesis)  | 8. You notice in the story that Ann Sullivan taught Helen to read first. Then she taught her to speak. Why do you think Ann trained Helen that way?        |
| (Inference)  | 9. What problems did Ann have in trying to teach Helen to communicate?   |
| (Analysis)   | 10. Imagine that you lived with Helen when she was a child in 1887. What things in Helen's surroundings could she never know as you might have known them? |
| (Analysis)   | 11. How is a blind-deaf person more handicapped in learning to communicate than a blind person?  |
| (Analysis)   | 12. Suppose Helen had been 10 years old when she became deaf and blind. In what ways would the story be different than the one you just read?              |
| (Analysis)   | 13. What were some of the things that helped bring about Helen's success?  |
| (Evaluation) | 14. Who do you consider to be the most important person or persons in Helen's life and why?  |
| (Synthesis)  | 15. If Helen was a child who lived today and became blind and deaf how might the story of how she learned be different?                                    |



- (Evaluation) 16. Is every blind-deaf person likely to be as successful as Helen Keller was - why or why not?



## APPENDIX H

### POSTTEST





Posttest: Child of the Silent Night

- |              |  |
|--------------|--|
| (Fact)       | 1. What was Laura's handicap?  |
| (Fact)       | 2. How old was she when this happened?   |
| (Fact)       | 3. Without the sense of sight and hearing how did she learn?   |
| (Inference)  | 4. What things could Laura never learn through the sense of touch?   |
| (Analysis)   | 5. Why was it important that Laura learn to communicate with people?   |
| (Analysis)   | 6. Why was it very difficult to teach Laura to communicate?  |
| (Analysis)   | 7. In the story you just read Dr. Howe said that Laura was "like a person alone and helpless in a deep, dark, still pit." What did he mean?  |
| (Synthesis)  | 8. You notice in the story that Dr. Howe and Jeanette Howe taught Laura to read first. Then they taught her to speak with her hands. Why do you think they trained Laura that way? |
| (Inference)  | 9. What problems did Dr. Howe and Jeanette Howe have in trying to teach Laura to communicate?  |
| (Analysis)   | 10. Imagine that you lived with Laura when she was a child in 1837. What things in Laura's surroundings could she never know as you might have known them?                         |
| (Analysis)   | 11. How is a blind-deaf person more handicapped in learning to communicate than a blind person?  |
| (Analysis)   | 12. Suppose Laura had been 10 years old when she became deaf and blind. In what ways would the story be different than the one you just read?                                      |
| (Analysis)   | 13. What were some of the things that helped bring about Laura's success?  |
| (Evaluation) | 14. Who do you consider to be the most important person or persons in Laura's life and why?  |
| (Synthesis)  | 15. If Laura was a child who lived today and became blind and deaf, how might the story of how she learned be different?   |



- (Evaluation) 16. Is every blind-deaf person likely to be as successful as Laura Bridgman was - why or why not?



## APPENDIX I

### ORAL DIRECTIONS FOR THE EXPERIMENTAL GROUP



Directions - Oral

I am interested in studying how pupils think about questions. Therefore during the next four weeks we are going to do special reading activities. We will be discussing several stories and a number of questions with them during that time. It will not be possible to complete a new story each day. It may take three or four periods to complete a single story. Whenever we begin a new story you will be asked to first speculate or guess about what might be involved in the story using only the title to help you.

Then you are to read the story or a part of it carefully, thinking about your speculations and what you are reading. You may reread the story or any part of it as often as you need to.

If, after you start to read, you find that you are not able to pronounce a word, simply raise your hand and the instructor will help you. Point to the word and she will pronounce it for you. If you have any question about the word at this time, please ask it during the discussion following the reading of the story.

After you have read the story you, as a group, will be asked a number of questions. These questions will not be asked any one particular pupil. You are asked to think carefully about each question and to voluntarily give an answer whenever you can.

If at any time during the discussion you have a question you'd like to ask, you are encouraged to ask it.

However, do not interrupt someone who is already speaking. If you wish to add a comment to what another friend has said, feel free to do so when he/she has finished speaking.





There will be enough time given for you to think about each question that is asked and to give your answers, or to comment on an answer that somebody else has given.



## APPENDIX J

### ORAL DIRECTIONS FOR THE CONTROL GROUP



### Directions - Oral

I am interested in observing how you organize your ideas and thoughts when you put them in writing.

During the next four weeks we are going to do special reading and writing activities. We will spend much time working together and discussing ways of saying in writing the ideas we have in our minds. You are asked to think very carefully about each exercise we do and to voluntarily give suggestions and ideas whenever you can. Much of our work will be done in discussions and these will be tape recorded. You will get the opportunity to work individually each day however, as well as working as a group.





APPENDIX K  
GRID FOR THE MODIFIED OHIO SCALES AS  
USED IN STUDY



Grid for the Modified Ohio Scales as Used Within this Study

For Classifying Pupil Responses - (Ohio Scales II)

		Higher-levels of thinking				
		Level 1 Random Response	Level 2 Literal	Level 3 Giving Illustrations, Applying, Interpreting	Level 4 Imagining Hypothesizing Theorizing	Level 5 Evaluating, Using Criteria
For Classifying Teachers' Questions and Statements - (Ohio Scales I)	Higher-level questions	Gathering Specific Facts				
		Clarification				
		Interpretation Inference				
		Analysis				
		Application				
		Synthesis ←	(modified from the original scales)			
		Evaluation				



APPENDIX L  
GRID FOR THE OHIO SCALES,  
WOLF ET AL. 1967



Grid for the Original Ohio Scales

For Classifying Pupil Responses

		LEVEL 1 Unsupported Guessing Random Response	LEVEL 2 Literal Recall Memory Cognition	LEVEL 3 Making Inferences Giving Illustration Applying Information Interpreting Convergent	LEVEL 4 Theorizing Hypothesizing Divergent	LEVEL 5 Evaluating Judging Giving Support for Stand Using Criteria
Gathering Specific Facts	Gives Statement	Asks Questions				
Clarifying						
Interpreting Inferring From Facts						
Analyzing						
Applying						
Summarizing Concluding						
Evaluating						

For Classifying Teachers' Verbal Behavior

Source: W. Wolf et al., Critical Reading Ability of Elementary School Children. Research Project No. 5-1040, U.S. Department of Health, Education, and Welfare, 1967, p. 173.





APPENDIX M

THE OHIO SCALES CATEGORY DESCRIPTIONS,

WOLF ET AL. 1967



Categories of the Ohio Scales for Classifying Teacher Verbal Behavior as Taken from the Wolf et al. (1967) Study (pp. 168-170)

Gathering Specific Facts

All teacher talk that is intended to bring information to the attention of the group is recorded as gathering specific facts. It includes fact stating, reporting information from books and authorities, getting the main idea, reading from a book, or requesting information from pupils. When audio-visual materials or resource people are used to present information, this will also be recorded as giving specific facts.

Clarifying

A clarifying statement or question is one used to refine previously discussed ideas or those misinterpreted by members of the group. It includes defining, clarifying a concept through an illustration, emphasizing a prior point, rephrasing, or making the meaning clear. Parroting statements are ignored unless an idea is expanded.

Interpreting and Inferring

An interpreting or inferring statement or question is one which goes beyond the literal meaning. It includes interpreting figurative language, inferring beyond the literal message, translating information into more comprehensible language, and extrapolating beyond the available data.

Analyzing

An analyzing statement or question is intended to separate or distinguish component parts of a situation, a piece of writing, or a phrase. It includes examining the nature and relationship of the



parts, searching for the organizational pattern or principles, or determining the internal consistency of a piece of writing or an argument.

### Applying

An applying statement or question is one in which the teacher makes or asks a student to make some direct application of information or criteria related to the lesson. It includes applying information to illustrate a point, applying criteria to be used in evaluation, and illustrating a generalization or a principle in a specific instance.

### Summarizing and Concluding

A summarizing statement or question synthesizes several preceding statements of fact and may show the relationship among several of those statements. It includes a summary; resume of events or an integration of several pieces of information.

### Evaluating

An evaluative statement or question is one in which a judgment is made based upon established criteria. It includes personal interpretation of judgments about the quality or accuracy of printed material. Judgments are made about the veracity, accuracy, or validity of data being considered and must be supported with evidence for that position. An evaluating question is one which elicits a decided judgment based upon previously established criteria. A child may use his own set of personal values as the set of criteria or use criteria established by the group.





Categories of the Ohio Scales for Classifying Pupil Responses  
as Taken from the Wolf et al. (1967) Study (pp. 168-170)

Level 1: Random Response

When there is unsupported guessing in response to a teacher's comment or question, a number is recorded in this column. If a child says "I don't know," it is recorded here. "I like," "I don't like" statements are considered random responses unless they are justified by further verification or show the use of data to make a decision, whereupon they become critical.

Level 2: Non-Critical - Literal

Non-critical responses are those which can be directly drawn from the material in the lesson. They will include factual answers, literal comprehension, reporting verbatim, and repeating previously agreed upon material.

Level 3: Giving Illustrations,  
Applying, Interpreting

Responses in which children give illustrations, interpret material, or apply information are recorded at Level 3. These responses are frequently those in which a child gives an example from his own life which exemplifies the point under discussion.

Level 4: Imagining, Hypothesizing,  
Theorizing

Pupil responses which go beyond the information available to the group are recorded in this category. They include going beyond the data, extrapolating, or diverging from the material before the group.



Level 5: Critical Thinking: Evaluating,  
Judging, Using Criteria

Responses recorded at Level 5 are ones in which students go beyond the literal meaning of printed matter, use data in an evaluative decision, make a judgment about the accuracy or quality of writing, see deeper meanings in the material, or recognize the fallibility of printed materials. Judgments must be supported with evidence and evaluations must be based upon established criteria. They include recognizing the omission of necessary data, distinguishing fact from opinion, and selecting and using relevant data in evaluative decisions.



APPENDIX N

SAMPLE OF SUPPORTED AND UNSUPPORTED PUPIL RESPONSES



### Sample of Supported and Unsupported Responses

Q. In the story you just read, Helen spoke about her life as "the long night." What did she mean?

P11 Well, she was blind so she couldn't see the sun. (Unsupported)

Q. In the story you just read Dr. Howe said that Laura was "like a person alone and helpless in a deep, dark, still pit." What did he mean?

P11 Like she can't see or she can't hear so really she can't do anything for herself. Like if somebody came in and did something bad to her she can't see or hear them. She can't hear anything so like things are still and it's always dark I guess, like being in a deep dark still pit. (Supported)

Q. Why was it important that Helen (Laura) learn to communicate with people?

P12 So she could understand things more or things. (Unsupported)

P12 So other people could understand her and she won't have to be upset all the time. Like she could share what she thinks—share her thoughts with them and be more like them. They'd understand her and she'd understand them then. (Supported)

Q. Who do you consider to be the most important person or persons in Helen's (Laura's) life and why?

P4 That little girl that used to go into the kitchen and the teacher that she had because they helped her. (Unsupported)

P4 Dr. Howe because he was the one who helped her the most. Like he was the one who had the idea of helping her and he taught her how to read and talk and things like that. (Supported)

Q. Is every blind-deaf person likely to be as successful as Helen Keller (Laura Bridgman) was? Why or why not?

P3 Yes in a way and no in a way. Yes, because like my grandfather his leg was all bad and they cut it off. And no because, let's say he came home blind and deaf. It would be harder for him. (Unsupported)

P3 It just depends—if they started young like Laura maybe. But let's say they started at thirty-eight and not five or eight years old like Laura. I don't think he'd have a very good job. He'd have to take you know, quite a bit of training and studying. (Supported)





APPENDIX O

PUPIL QUESTIONS RAISED DURING DISCUSSIONS



## Pupil Initiated Questions

Lesson	Pupil No.	Questions Asked	Code
#2	P10	Who's Susan Wright?	CTQ
#7	P15	Is it that Melissa knew Apple Annie?	QSH
#7	P15	. . . wouldn't the boy be her relative and he hollered Apple Annie?	QSH
#7	P13	How could he know her name then?	QPP
#7	P15	Why would they have apple in it then?	QPP
#11	P14	What would happen if someone went swimming and they had diabetes and sort of fainted like because of that sugar stuff, and then, he didn't get enough of it?	QSH
#11	P14	What if a little five year old was sent to that camp. How would that person balance his diet when he doesn't even know what it's for?	QSH
#11	P14	Well, don't you just keep about eleven or twelve pills in your pocket and if you sort of drowsy, take a pill quickly before you get a reaction?	QSH
#11	P14	Well, if you feel dizzy, why don't you take it right away.	QSH
#15	P12	What's that?	CPP
#15	P14	Why would everything be . . . meaningless like why would he be trying to get home again?	QPP

Code: CTQ - Asks for clarification of a point within the teacher's question.  
 CPP - Asks for clarification of a point made by another pupil.  
 CWM - Asks for clarification of a word meaning.  
 QPP - Questions a point made by a pupil.  
 QSH - Questions own speculation or hypothesis.  
 AQR - Asks for the question to be repeated.



Lesson	Pupil No.	Questions Asked	Code
#15	P16	What if his wife was pregnant?	QSH
#15	P16	Good things or bad things?	CTQ
#15	P16	Yes but is it important of a good thing or a bad thing?	CTQ
#15	P12	Well, how can big ships go through a lake?	QPP
#15	P11	What's he saying?	CPP
#15	P14	. . . but if the ship sunk and another ship came along, couldn't they see on the radar screen that the ship was there?	QPP
#15	P14	What if some boards were on top?	QSH
#19	P14	That was still summer, wasn't it?	QPP
#19	P11	Jan. Isn't that a girl's name?	CWM
#19	P14	The way this letter sounds, doesn't it sort of feel like they're Indian or something the way they're writing?	QSH
#19	P9	Could you repeat it?	AQR
#19	P13	. . . don't all teachers go on supervision?	QSH
#19	P10	What does appearance mean?	CWM
#19	P12	Is it the same as appear?	CWM
#19	P13	What happens if . . . there might be about four dumb girls and five dumb boys and they're still sitting together?	QSH

Code: CTQ - Asks for clarification of a point within the teacher's question.  
 CPP - Asks for clarification of a point made by another pupil.  
 CWM - Asks for clarification of a word meaning.  
 QPP - Questions a point made by a pupil.  
 QSH - Questions own speculation or hypothesis.  
 AQR - Asks for the question to be repeated.





APPENDIX P

CODING OF THE LESSON TRANSCRIPTIONS



### Coding of Pupil-Teacher Verbal Interaction in Transcripts

1. Pupil responses were labelled according to the pupil number first, followed by a number indicating the level of the response and where appropriate, a letter code indicating the level of complexity for that response. For example, a response labeled P13-3LDC indicated a response made by pupil thirteen. The response was at Level 3 and demonstrated a low degree of complexity within that level.

2. Certain pupil responses were further labelled NFQ. This indicated the response did not fit the question and was therefore not appropriate for the question asked. The function code for the teacher's questions discussed below, was occasionally used for pupil questions.

3. All teacher questions and statements were labelled as to kind and function. The letter T indicated a teacher directed statement or question. Enclosed within brackets was the level of the question or statement, following which was a letter code indicating the function of the question or statement: extending (EX), raising (R), lowering (L), focusing (F), refocusing (RF) or changing the focus (FC) of pupil thought.

A coding of T(Analysis)F, for example, indicated the teacher's question was at the Analysis level and set the focus for pupil thinking.

4. Occasionally throughout the transcript numbers were indicated in brackets before the coding of the teacher's question. This number indicated that this particular question was one of the higher-level questions found in the transcript and considered in the analysis of the data. For example, a coding of (5)T(Synthesis)FC indicated that this particular question was the fifth higher-level question found within the transcript. It was teacher directed, classified as synthesis and served the function of changing the focus of pupils' thinking.



The Function Coding for Teacher's Questions and Statements

- F Focus - a statement or question that provides the topic of the discussion.
- RF Refocus - a statement or question that returns the classroom to the topic under discussion.
- FC Focus Change - a statement or question that changes the topic under discussion.
- EX Extension of Thought Levels - a question or statement which functions as an extension whenever the teacher or child seeks or gives additional information on the same level of thought which is for the purpose of elaboration or clarification of information already provided.
- R Raising of Level - a question or statement which functions to lift the level of thought whenever the teacher or child seeks or gives information that changes the level of thought to a higher level than had previously been established.
- L Lowering of Level - a question or statement which functions to lower the level of thought from that previously established.



APPENDIX Q

SAMPLE LESSON TRANSCRIPTION





Lesson Transcript and Analysis of Pupil-Teacher Verbal  
Interaction Related to Larry Charts a Course

Introduction

T In yesterday's lesson we discussed how Larry's mother's behavior toward him and his illness made Larry feel. You said that he disliked his mother's concern because it made him seem a 'baby' before all the other children. It made him feel a 'sissy' others said because she wouldn't let him take part in all the sports that boys enjoy.

We then looked at Mrs. Foster and her reasons for feeling so concerned. You said Larry was probably her only child and she didn't want him to die so you couldn't blame her for the way she behaved. Others of you said she had a problem in that she didn't understand enough about diabetes to be able to help him do some sports. We also discussed why Larry did not always obey his parents and you suggested that it was because he wanted to do all the normal things that other boys did; he found it upsetting that he couldn't and that he was teased by the other boys, and that he felt he was being babied by his mother.

Then Larry went to camp and we found he was allowed to do all the sports he had always wanted to do.

(1)T(Synthesis)F Yesterday at the end of the period two of you in particular were asking one special question. 'Why do they allow Larry to go swimming at camp when he has diabetes?' Do \_\_\_ and G \_\_\_ in particular mentioned that they could not understand why Doctor Green, Larry's home doctor had told him he couldn't swim, and yet when he goes to camp, he is allowed to swim. Can anybody explain now, having finished the story, why they allowed Larry to swim at camp?

P16-2 Well, because there were more people to look after them for swimming and all that and he also had lots of pills he could take before he went swimming, and there's a doctor closer.

(pause)

T Any other suggestions?



P14-FC                      What would happen if someone went swimming and they had diabetes and ah sort of fainted like because of that sugar stuff, and then, he didn't get enough of it? What would happen to him? Would he die?

T(Interpretation)        What do you think would happen to him?

P14-1                      I don't know.

P13-3LDC                  Well, there might be two reasons, when he's unconscious well he might just stay on top of the water and then when he wakes up he might be still alive and then the other way he might just die.

T-EX                      Chances are he would drown, yes, if he was alone and nobody was there to rescue him. But with people there to rescue him at camp he would most likely be rescued.

P12-2                      It says at the end of the story when he was going out to get the boat that he was going to get a reaction but he took one of his pills.

T-RF                      Yes, he thought he might get a reaction so he took a pill.

                              You still haven't gotten to the question though, that puzzled us yesterday. Why is it that Larry can swim at camp but he could not swim when he was at home. Now you already made the point that there were more people there to look after them and there was a doctor always there. But there is a special medical explanation as to why he can swim at camp. Does anyone know a medical reason that explains why Larry can swim?

(2)T(Synthesis)RF

P13-1                      It was salt water.

P16-2                      There was like they had special shots for going into the water.

T(Factual)EX              Were they only for going into the water?

P16-2                      Or pills; or sort of reactions.

T(Interpretation)L        Alright, let's consider it this way. What was one thing they were trying to teach them at camp?



- P14-2                      That not all diabetics have to do is stay in bed and do hobbies or things like that. They could do things they wanted.
- (3)T(Analysis)R            Yes. How would they be able to do anything they wanted to do?
- P13-3LDC                  Well maybe the doctor had a special way how to show them and everything and you had to take a certain pill or an injection so you wouldn't tire out so fast.
- T(Interpretation)L        How are they teaching them to do that?
- P14-3ADC                  Well they sort of like when I went to camp they sort of made a time table for us to go in certain places. And they probably did that at that camp too to do certain hard games and all that and then when they sort of felt dizzy then they'd take care of themselves and not bother anyone else they'd just teach them to do that, and then like if ah ah I forget what I was going to say ah— (tries but can't recall what she intended to say). (Pause)
- T(Interpretation)EX       Well, I think you made a very good point Do\_\_\_. One point you made was they would teach them to take care of themselves. Now, what are they doing to teach them to take care of themselves?
- P16-2                      Like they give them pills before they do anything. Like they keep pills in their pockets or something. Like if they have a reaction in the water they always have something with them to keep them from not having a reaction and they know to take it.
- T                            Good.
- P14                         I have a question.
- T(Factual)EX              Can you hold it for just a minute Do\_\_\_ please. W\_\_\_, to go back to a point you made: They know when to take a pill. Look back to page 291. When Larry finally gets the boat ashore what does he tell the doctor he has done?
- P15-2                      He took his pill before he had a reaction.
- T(Factual)EX              Did he have a reaction?
- P15-2                      No. He took them before.





T(Factual)EX                   He took them so he wouldn't get a reaction.  
Where did he get the pills?

P11-2                           From the doctor.

P13-2                           In his cabinet.

P12-2                           No, in his pocket.

P14-2                           Well, he learned that before he dived into the  
water he remembered that he might get a reaction  
so he remembered that he had some ah two of  
those pills in his jean pocket and so he ran  
to get them and he sort of held on to them or  
something.

P11                             No! No! I know (interrupting).

P                               No. No. I know. I know.

T                               Just one minute please. (Raises hand to  
quieten those arguing.)  
  
You missed one point, one bit of information  
Do\_\_\_ about the pills but the rest is fine.

P11-2                           He got them from the glove compartment.

P13-2                           Well, he went to the cabinet (interrupted).

P11-2                           Glove compartment.

P13-2                           Well, glove compartment and there were the  
pills in there.

T(Interpretation)R           Yes but he's already at the boat then. He took  
precautions before he got in the water. How?

P16-2                           Well, it says here about the pills, it says  
(reads) "Then he remembered the glucose pills  
in his pocket of his trousers." (Stops)

T(Factual)EX                   Yes, what did he do then?

P16-2                           (reads) "He took the pills first to replace the  
blood sugar that would be burned up through the  
strenuous exercise."

T(Interpretation)R           Yes, why is he taking the pills?

P14-2                           Cause like, the sort of sugar that's in his  
body already might sort of burn up.



T(Factual)EX                    And then he would have none, yes. So he took the pills he had in his jeans pocket, Do \_\_\_\_\_. He didn't hold on to them, right? Then Da \_\_\_\_, what did he do when he got to the boat?

P14-2                                Went to the glove compartment and got some more pills.

T(Interpretation)R                Why did he get them again?

P14-3ADC                            Because if he was going to bring the boat back to shore then he'd use up some more strength so he'd need more pills.

P11-3LDC                            It was a precaution.

P13-3ADC                            He thought the others wouldn't last him so he took more from the glove compartment.

P15                                    He thought that reaction (difficulty expressing).

T                                        Pardon?

P15                                    I have a question.

T                                        I'd like for you to make your comment first.

P15-2                                Well, I have a question anyway. Maybe he thought he might have a reaction so he took some more pills.

T(Factual)EX                        So he could get back to shore with the boat, yes. Now then, go back to the point he told the doctor when he got on shore. You've already told me what that was (interrupted).

P14-2                                He said that he saw the boat going away from shore and so he took some pills out of his pocket and he took them and he swam to the boat. And then the doctor remembered that he had won some trophies and his picture was in the newspaper.

T(Factual)EX                        O.K. but let's go back to a point you probably overlooked. He did tell the doctor that he took the pills before he got in the water and again when he was in the boat. What did the doctor say to him when Larry told him that?

P12-2                                It says here, "Larry said that he was sorry to worry everyone and explained how he had taken



the precautions against the reactions."  
(Stops.) (Pause.)

T(Fact)EX

O.K. then, I asked you, what did the doctor say?

P12-2

(reads) "Wonderful Larry! exclaimed Dr. Richards, who had been listening. This is what we hope all you campers will learn to balance your own diet and exercise wisely."

(4)T(Synthesis)R

Now can you explain why Larry was having all the reactions before he went to camp?

P16-2

Because he didn't take any pills.

T(Factual)

He was taking insulin.

P9-2

He didn't exercise wisely.

T(Interpretation)L

What must he do with his exercise?

P13-2

He didn't keep his balance.

P11-3LDC

He didn't balance his pills and his exercise.

T(Factual)EX

Yes, he didn't balance his pills with his exercise. Now go back to a point we made yesterday. We said his mother would not allow him to do all these strenuous things.  
(Interrupted.)

P16-3LDC

Because he didn't take his insulin with with when he was playing his rough games, he took it after, or before.

T(Interpretation)EX

Well, what was the important thing he was not doing?

P16-3LDC

Not taking them together.

P11-3LDC

Not taking it regularly.

Pupils

(speaking together - not able to be transcribed)

P

. . . balancing it.

(5)T(Application)R

Right, he was not balancing both. Then, if you were a diabetic and you were going to spend most of your summer playing heavy sports, what would you have to learn to do?



P13-2                    Balance your pills and to balance it yourself on a chart.

P12-2                    Your diet.

T(Interpretation)EX    What do we mean by balance your diet?

P11-2                    Balance your pills and your exercise.

P14FC                    Can I ask a question eh what if a little five year old or something was sent to this camp and was running around and everything and had a reaction about every half hour. How would that person sort of balance his diet when he doesn't even know what it's for?

(6)T(Evaluation)F      Alright. Do you think a five year old can be taught that?

P14-1                    Well, I don't know.

T(Inferring)L           Did anyone at this camp know what balancing a diet is for?

P13-2                    They all do.

T(Interpretation)R      Now they do, yes. But did they know before camp?

Pupils                   No, no.

T(Interpretation)EX    Do you think a five year old could be taught that?

P16-rLDC                Well, I think he's too young maybe, but if he's at the camp he might learn a little.

T EX                    Yes, if he attended the camp, he might. But maybe his parents would still have to help him quite a bit because he is very young.

(7)T(Application)FC    Suppose now that I am a diabetic and I plan to spend all next week lying in the sun reading books and just talking with friends. How will my pills be different than if I planned to play basketball and soccer each day.

P -3LDC                  They won't be the same then.

T(Interpretation)L      What would be the difference?

P12-3LDC                Well, because you're not exercising.





T(Interpretation)EX      So how would that affect the pills I'd take?

P12-2                      Well, then you would have to take ah you wouldn't be balancing them.

T(Interpretation)EX      But you'd have to balance them.    How?

P11-3ADC                  No, you wouldn't take as many because you're not exercising and sugar's not getting burned up.

P13-3ADC                  I say no too, cause you wouldn't use up as much energy just lying in the sun being lazy. So you just balance for well, how much you're doing your exercise, running around burning up your energy.

T(Interpretation)L        I'd be getting some exercise though, maybe only walking in and out of the house.    How would I balance the pills with that exercise?

P16-3LDC                  Well, you take your pills with what you're doing.

P15-3LDC                  Use exercises but take the same amount of pills.

T(Interpretation)EX      Some days you are not getting much exercise at all.    How many might you take then?

P11-3LDC                  Maybe you take just one.

P16-2                      Take the pill before you do anything, then that balances it.

T(Interpretation)EX      How will that pill differ from days when you're going to be very active?

P16-4ADC                  You could cut it in half.    Then when you're not exercising you take half.    But when you're exercising you take a whole pill, or a lot more than you usually do when you're not exercising.

T(Clarifying)              That's exactly it.    You balance your pills by changing the number you take.    On days when you are not exercising much you take less pills.    On days when you have a lot of exercise, you take more pills.    That's balancing your pills with your exercise.

P14                        Well, don't you just keep about eleven or twelve pills in your pocket and then if you feel sort of drowsy you take a pill quickly before you get a reaction?



P13-2                    You don't really feel drowsy, it's dizzy.

P14                      Well, if you feel dizzy, why don't you take it right away?

T(Factual)EX            Yes, that's one thing they learned at camp, to take them then too, but you do not want to wait until you're dizzy, for example as then a reaction might be very, very close. Dizziness is a danger signal, yes, but you need to take your pills beforehand as a precaution.

(8)T(Analysis)FC        Now think about this question. In what ways do you think the summer camp was a worthwhile experience for Larry?

P13-2                    Well, it showed him how to take his pills and everything.

T(Clarifying)            Explain what you mean by 'everything.'

P13-3ADC                Like how to take his pills, take more when you need them, take less when you need them. Stuff like that.

P14-3ADC                Well I say it was worthwhile because like at home everyone was teasing him and he didn't want to get teased any more. He was kind of sick of it and sort of lonesome, so he thought that at camp he'd get some more friends and when he well he didn't like the taste of that fruit juice or whatever he was drinking and so he went to camp to see if there was anything better there.

T(Factual)L              Did he find anything better?

P14-3LDC                Yes, he found friends like himself and they didn't tease.

T(Interpretation)R      What did he learn from this?

P11-3LDC                That there's others like himself. He's not the only one.

P16-2                    And he learned how to take care of himself.

T(Factual)EX            Who took care of him before?

P16-4LDC                His mother, and his mother is getting tired so it's better for him to go to camp and learn how to take care of himself instead of everybody taking care of him.



T Yes. What did you want to say C\_\_?

P12 I was going to say the same thing.

T EX Anything else that was worthwhile for him?

P13-4ADC (noise on tape) cause he said why should I take them and that in the story, so it would have made it worthwhile for him so he wouldn't have to then. He'd just blame it on himself.

T(Clarifying) What do you mean by 'blame it on himself'?

P13-3ADC Like he's always blaming it on his mom cause he can't play soccer and stuff like that. He says oh why should I live and stuff like that; there's no cure for diabetics and stuff. So, if he had something to blame he'd blame it on himself after that.

T(Clarifying) Once he has learned to take care of himself he can blame himself if he doesn't, you mean.

P15-2 Like at home he couldn't do certain things because his Mom said, Don't do this; Don't do that. But there he could do all his favorite sports like especially swimming and soccer.

T(Inference) What made it possible for him to do all his favorite sports?

P15-2 He took his pills, he had a pill balance.

P11-2 He balanced his diet.

P16-2 And like he because he knew how to take care of himself he could do all those sports.

T EX Was there anything else that was worthwhile for Larry?

P10-2 He learned how to swim better.  
(others laugh)

P16-2 He already knew how to swim.

T(Interpretation)R He knew how to swim but he did learn something from his swimming. What might he have learned?

P10-2 Well when they had that contest and then when he went by that boat (stops).





- T(Interpretation)EX      What do you mean Da\_\_\_ when you say, he had that contest, and he went by that boat. You're not telling anything about either. What do they do to Larry?
- P15-3LDC                    (Interrupting Da\_\_\_) Makes him a hero.
- T(Factual)EX              Yes, he feels very much a hero.
- P12-3LDC                    Makes him happy.
- T(Interpretation)EX      Why is he so very happy now?
- P12-2                        Because he learned how to take care of himself now and he's won a trophy.
- P15                          Mrs. Muise, Da\_\_\_'s poking me.
- T                             Put your chair to the side of the table Dn\_\_\_.
- P16-2                        Like after he took his pills and when he went by the boat and he was proud of himself. He learnt how to take care of himself and so he's proud of that.
- T(Interpretation)EX      Yes he's proud of himself and also proud that he rescued the boat. What else is he proud of?
- P14-3ADC                    Well he's proud of sort of what he did and how he feels, like eh like he feels like another healthy boy.
- T(Summarizing)            Exactly! So all these things you've said made the camp worthwhile: One, Dn\_\_\_ said he now feels a hero; two, He now feels proud of what he's done and proud that he can take care of himself; three, and he feels he's a normal healthy boy (interrupted).
- P13-3LDC                    He now feels like he was when he was little.
- T(Clarifying)              When he was little?
- P13-2                        Well not little but when he was captain and all that.
- T(Clarifying)              Yes, he now feels like he felt before he got diabetes. Well all these things made the camp worthwhile for him.
- (9)T(Evaluation)FC        Can you argue this statement now?
- "Larry would have learned to lead a normal healthy life without going to camp."



P12-1 No.

T(Clarifying) Argue your point. Why do you say no?

P12-2 Then he wouldn't have learned to take care of himself.

T(Clarifying) Why do you say that?

P12-3LDC Cause then his mother would have to take care of him again.

P14-4LDC I disagree with C\_\_\_ because if you can learn how like a little child can learn to go to the bathroom by itself. Why can't Larry learn to take the pills all by himself?

(10)T(Synthesis)L Why hadn't he learnt before camp?

P14-3LDC (NFQ) Well, a little child learns to go to the bathroom at a certain time. So that's the same as Larry.

T(Fact)L How old is Larry?

P13-2 13.

P14-1 That old!

T(Fact) Yes, he's thirteen.

P16 Like he ah what was the question again?

T RF I wanted you to argue this statement:  
 "Larry would have learned to lead a normal healthy life without going to camp."  
 C\_\_\_ said no he wouldn't because his mother would be taking care of him and he wouldn't learn to take care of himself. What do you say?

P16-3ADC I agree with C\_\_\_ because his mother didn't know much about eh how eh teach him how to take care of himself and when he went to camp doctors were there to teach him how to take care of himself.

P11-4ADC I'd say he wouldn't have learned to lead a normal healthy life because like his Mom won't give him a chance to because every time he got into trouble or something his Mom would help him so he wouldn't learn.



T(Interpretation) Think about what you said, Da\_\_\_. What important thing would be necessary then for him to develop a normal life?

P11-3LDC His Mom to leave him alone, to give him a chance.

P15-3LDC Well what W\_\_\_ said, she said that there were doctors there and everything to help them but before like someone said that Larry sort of learned by himself at camp, like when he went to rescue the boat from the water, well he learnt by himself with those pills.

T(Clarifying) Did he learn by himself?

P15 Well sort of because of ah ah (fumbles).

T(Factual)EX Well we'd better be exact Do\_\_\_. Can you find something in the story that proves he learned by himself? Give some evidence from the story for what you're saying.

P16-3ADC Doctors helped him to learn and then he learnt by listening and so he learnt by the doctors cause they told him how to take the pills, cause you just don't go and take a pill whenever you feel like it.

P13-2 Well I'd say he wouldn't because before he didn't - ah use to just sit in the house he wanted to go out and be like the others and play soccer and stuff like that. He'd just have to sit in the house and build models and that, and then when he went out there he had more fun and he could go swimming and play games because the doctors showed him how.

T Da\_\_\_, what do you think? (Repeats question.)

P10-1 No, I don't think so.

T(Clarifying) Explain why.

P10-3ADC Well if he never went to camp he wouldn't have learnt to take the pills, he'd have to be in bed all day, couldn't do anything, couldn't go swimming or do all the things he liked. He'd be like before.

T(Interpretation)EX Then what do you see as the important thing in his learning to develop a healthy life?











P16-4ADC                    Like he has learned already and before he didn't know how to do anything and he's learned and so he can take care of himself when he's playing a game or something.

P9-3LDC                    Like he can go swimming now and always play soccer and other rough games and keep pills in his pocket.

P13                        Can I say something before that question?

T RF                       No, answer this question first please. Why is Larry likely to be less frustrated when he returns home from camp?

P10-3LDC                  He doesn't have to sit in bed and do models and everything. He can go out and play anything he wants to.

T(Interpretation)EX      What will happen now when he goes out with others?

P11-3LDC                  When he gets in a fight now his Mom won't have to go out

P16-3LDC                  because he can take his pills

P9-3LDC                   before he gets into a fight.

P15-3ADC                  Well like when Larry has a fight he can quickly slip a pill into his mouth and swallow them so he can sort of fight back like a normal boy.

T(Interpretation)EX      Do you think he is likely to have as many fights?

P16-3LDC                  No because now he can play soccer games and he can't be "chicken" any more.

P9-3ADC                   Like he won't have as many fights cause he can play soccer now and the other boys won't tease him as much so he won't have to get mad.

T                          Yes, good! Well our time is up. We'll have to stop for today but you've come up with a lot of good ideas as to why Larry won't be as frustrated when he returns home from camp. We'll have to continue from here tomorrow.



APPENDIX R

ILLUSTRATIVE LESSONS FOR CONTROL GROUP

(INTEGRATED LANGUAGE ARTS SKILLS)



## Lessons 1-3

**Purpose:** To develop simple sentence structures into complex sentence structures.

**Materials:** A series of simple sentences such as the following:

1. The farmer saw the airplane.
2. The boys needed bicycles.
3. The letter arrived.
4. The pilot walked away.

- Procedure:**
1. Discussion of each simple sentence in terms of the information it provided about the subject.
  2. Expanding through discussion the nouns and verbs of the sentences through a series of questions:  
     e.g. Re. Sentence 1. (a) Which farmer?  
                             (b) Which airplane?  
                             (c) When did he see it?
  3. Recording each piece of information within the simple sentence and noting how the sentence structure is altered to include the new information.
  4. Comparing through discussion a simple and complex sentence using the exercises completed.
  5. Written practice exercise expanding simple sentences.

**Outcome:** Pupils produced complex sentence structures such as the following sample:

"The Canadian farmer, working in his field, saw a Boeing 737 airplane crash near his field on November 29."

"One year ago Bill, the pilot, walked away from his plane, The Spitfire, after its engines exploded."

"The pilot, Mr. Scott, walked away from his burning plane shortly after midnight because the fire was spreading."





## Lessons 4-6

**Purpose:** To develop complex sentence structures by combining simple sentences.

**Materials:** A series of simple sentences such as the following:

1. (a) It may rain tomorrow.  
(b) The farmers will not be able to plant their gardens.
2. (a) John could not ride his bicycle.  
(b) The bicycle had a flat tire.  
(c) John took a bus.  
(d) John went to the Post Office.  
(e) John wanted to catch the 3 o'clock mail closing.

- Procedure:**
1. Discussion of the information contained within each simple sentence.
  2. Explaining that simple sentences can be combined to make complex sentences by relating single ideas.
  3. Demonstrations of combining simple sentences through group participation.
  4. Noting how many single ideas are in the combined sentences and underlining each as they relate to the original sentences.
  5. Practice exercises.

**Outcome:** Pupils produced complex sentences such as the following sample:

- (1) "If it rains tomorrow the farmers will not be able to plant their gardens."
- (2) "John took a bus to the Post Office to catch the 3 o'clock mail closing because he could not ride his bicycle which had a flat tire."

"Because John's bicycle had a flat tire he could not ride it to the Post Office so he took a bus in order to catch the 3 o'clock mail closing."



## Lessons 7 &amp; 8

**Purpose:** To develop an understanding of complex sentence structures by identifying the single ideas within them and rewriting complex sentences in as many simple sentences as possible.

**Materials:** Complex sentence structures such as the following:

1. Mary, who had spent six weeks in hospital, looked small and frail as she walked to her father's car.
2. The day of the races came at last and John, who had waited eagerly for two weeks, went to the race track with his new bike.
3. Carefully carrying the screaming child on his shoulder, the fireman walked down the ladder from the fifth floor of the burning building.

**Procedure:**

1. Review of the combining of simple sentences as in the previous lesson.
2. Explaining that pupils are to identify the single ideas within each complex sentence and write each as a simple sentence.
3. Demonstration exercise involving group participation.
4. Written exercise as seatwork activity.

**Outcome:** Pupils produced a series of simple sentences for each sentence such as the following:

1.
  - (a) Mary spent six weeks in hospital.
  - (b) Mary looked small.
  - (c) Mary looked frail.
  - (d) Mary walked to the car.
  - (e) The car belonged to her father.
2.
  - (a) The day of the races came at last.
  - (b) John had waited.
  - (c) He waited for two weeks.
  - (d) John was eager.
  - (e) John went to the race track.
  - (f) John took his new bike.
3.
  - (a) The fireman carried the child.
  - (b) He carried the child carefully.
  - (c) The child was screaming.
  - (d) He carried the child on his shoulder.
  - (e) He walked down the ladder.



- (f) He walked from the fifth floor of the building.
- (g) The building was burning.



## Lessons 9-10

**Purpose:** To develop awareness of a relationship between sentences in written selections.

To develop skill in identifying words within a sentence related to words and clauses of the preceeding or succeeding sentences.

**Materials:** Paragraphs of two or three sentences such as the following:

1. Now there are twelve red apples hanging on the tree. Each day they seem to grow redder and brighter.
2. People in other parts of the world use other ways of measuring. In India, for example, a merchant sells cloth by the hath, not by the yard.
3. Scott's first plan was to make for Narvik about thirty miles away. Here he hoped to get enough bread, fruit and water to last the rest of the journey.
4. Most people had looked over all the things and decided what they wished to buy. Several ladies had looked at mother's big corner cupboard and decided to buy it. Several men had made up their minds to buy the old ram.

- Procedure:**
1. Discussion of the term 'relate'.
  2. Extend the term 'relate' to written sentences, developing the idea that sentences within a paragraph are connected or related.
  3. Explain through demonstration and discussion of short paragraphs that often we can note words that refer to another word or idea in the previous or following sentence or sentences.
  4. Practice Exercise: Identifying relationships between sentences in short two and three sentence paragraphs by underlining related words and phrases.

**Outcome:** Pupils identified related parts of sentences such as the following:

(1) People in other parts of the world use (2) other ways of measuring. In India, for example, a merchant sells cloth by the hath.

(1) Most people (2) had looked over all the (3) things and decided what they wished to buy. Several ladies had looked at mother's big corner cupboard and decided to buy it. Several men had made up their minds to buy the old ram.





## Lessons 11-12

Purpose: To develop skill in writing pairs of related sentences.

Materials: A series of sentences with a word or phrase underlined such as the following:

1. Slowly Roger climbed the attic steps.
2. There is a very practical reason for having a basement in a house.
3. Last Saturday proved to be one of the worst days in my life.

Procedure:

1. Review selected paragraphs of previous lessons noting the relatedness between various sentences.
2. Present demonstration sentences with a word or phrase underlined.
3. Explain that pupils are to give a sentence relating to the underlined word or part.
4. Copy suggested sentences on board.
5. Assign exercise as independent written activity.
6. Exchange written ideas in oral presentation.

Outcome: Pupils produced related sentences such as the following:

1. "Last Saturday proved to be one of the worst days of my life. My tennis racket broke, my baseball popped and my bat cracked, all in one hour. What an awful day!"
2. "Slowly Roger climbed the attic steps. They were rickety steps and they creaked as he walked on them."
3. "There is a very practical reason for having a basement in a house. It provides room for a deep freezer, a washer and a dryer. And if you need more sleeping space, you can easily build a room there."



## Lessons 13-15

- Purpose:
1. To develop awareness of relationships between sentences of more complex paragraphs.
  2. To outline paragraphs, showing the relationships between sentences.

Materials: Prepared short paragraphs such as the following:

1. Eddy's concern was for the blind people. For thirteen years he was president of the World Council for the Blind. Eddy spread the CNIB's self-help program from Trinidad to Tokyo. For this service to millions he was awarded the first Helen Keller award in 1960.
2. The skipper and the mate came forward to inspect the damage. All the headsails had gone except the flying jib. The two topsails had also gone and only the foresails remained. But the most serious damage had been done to the lower sails.
3. Thomas Edison was one of the world's great inventors. His inventions have affected almost every aspect of our lives. For example, when we turn on an electric light, we are benefitting from his inventions. When we pick up a telephone, we are using some of his ideas. When we put a record on or watch a movie, we are enjoying the results of his inventions. Indeed, Edison's inventions have had an important effect on all of our lives.
4. Some fossils have changed very little during their long burial; others have changed a great deal. The bones and teeth of dinosaurs have changed very little and can be picked up and examined. A piece of wood will have changed so that it looks like wood but it does not feel like it. It has hardened to rock. A leaf itself has disappeared but its outline remains clearly on the mud where it fell.

- Procedure:
1. Review of the concept of relatedness between sentences as discussed in previous lessons.
  2. Developing through discussion and demonstration the concept of expressing the relationship between sentences of a paragraph in a maplike form.
  3. Practice exercises to be outlined.



Outcome: Pupils outlined prepared paragraphs in the following manner:

Map Form: I \_\_\_\_\_

(a) \_\_\_\_\_

(b) \_\_\_\_\_

II \_\_\_\_\_

Expanded Form: I Eddy's concern was for the blind people.

(a) For thirteen years he was president  
of the World Council for the Blind.

(b) Eddy spread the CNIB's self-help  
program from Trinidad to Tokyo.

II For his service to millions he was  
awarded the first Helen Keller award  
in 1960.





## Lessons 16-18

**Purpose:** To develop skill in writing short paragraphs in an organized manner utilizing an outline.

**Material:** 1. Photographs from the series People in Action—Role Playing and Discussion Photographs for Elementary Social Studies, by Fannie and George Shaftel, a publication of Holt, Rinehart and Winston, Inc., 1970.

2. Incomplete outline such as the following to accompany each set of pictures.

I Each day there are problems to be solved.

(a) \_\_\_\_\_

(b) \_\_\_\_\_

(c) \_\_\_\_\_

(I) (A concluding statement.)

- Procedure:**
1. Review of previous lessons noting the following relevant points: (a) Thoughts can be put in a maplike form called an outline; (b) A main thought can be supported or expanded; (c) A concluding statement might or might not end the paragraph.
  2. Presentation of the diagram form to be used in writing the paragraphs, and discussion of what is required.
  3. Presentation of pictures from which they are to obtain necessary information to complete the outline and write the paragraph.
  4. Completing the outline as a group and writing a paragraph from the outline as a group.
  5. An independent practise exercise.
  6. Sharing ideas in an oral presentation.

**Outcome:** Pupils wrote paragraphs such as the following samples:

1. Each day there are problems to be solved. Someone tears your book and you don't know who. A dog has got injured and the driver didn't stop so that causes a problem. And you accidentally break the neighbor's window with your bat. Somehow all these problems must be solved.



2. Tim Ling's father explains the big city to him. He tells him that the Kong Chow Temple is where many people pray. It's an old, old building that was built in 1875. They walk down the street and Mr. Ling explains how the fire alarm works. Tim wants to try it but his father says no. Learning about a big city is new and exciting for Tim because he lives on a little farm.



## Lessons 19-20

Purpose: To identify patterns of organization in short written expository selections.

Materials: Selected passages from: Gates, A. I. and Peardon, C. C., Reading Exercises, Elementary—RD, New York: Bureau of Publications, Teachers College, Columbia University, 1963.

- Procedure:
1. Review of skills identified in previous lessons relating to the inter-relatedness of sentences within a short paragraph.
  2. Presentation of selected passage for group identification of such skills as discussed and studied previously.
  3. Outlining those parts that show relatedness between sentences.
  4. Independent practice exercises.

Outcome: Pupils gave outlines such as the following:

- I The starfish is a very interesting sea animal.
  - (a) dishlike body and mouth in center and large stomach
  - (b) five arms - eye at the tip of each
  - (c) no head
  - (d) tough skin and flat plates for bones.
- II Starfish crawl by means of feet with suckers on them.
  - (a) the feet are pushed out through holes under each arm
  - (b) the feet fasten to objects by suckers
  - (c) the body pulls forward.
- III The starfish lives in pools and on the ocean floor.
- IV The starfish eats oysters, clams, mussels and snails.
  - (a) holds both sides of oyster shell with feet and pulls
  - (b) shells open because the muscles of the oyster cannot stand a steady pull
  - (c) oyster is devoured.



APPENDIX S

GENERALIZATION STRATEGY AND QUESTIONING STRATEGY FOR  
THE STORY "GET IT RIGHT ON PAPER"

(Story Source: People Like Me: Person to Person, Gage,  
Strategies for Language Arts I, pp. 4-14)





Generalization Strategy for Get It Right on Paper

The first feelings of success      - (a) expanding and pursuing new or  
give inspiration, confidence,      related ideas.  
and stimulation toward      - (b) modifying the present discovery.

5. \_\_\_\_\_

Inventors must have certain qualities to be successful.

4. \_\_\_\_\_

That particular person generally has qualities essential for  
developing others' interests.

3. \_\_\_\_\_

Often there is some important person who develops, directs and encourages  
the inventor's interests.

2. \_\_\_\_\_

Inventions often result from interests and qualities developed from childhood.

1. \_\_\_\_\_

Theme - Inventions and Inventors



Questioning Strategy for Get It Right on Paper—Key Questions

- |                            |   |
|----------------------------|---|
| (Fact)                     | 1. What was the story about?  |
| (Synthesis)                | 2. What qualities does the writer show us in this story as necessary for an inventor.   |
| (Evaluation)               | 3. Compare the qualities of Wilbur and Orville. Who do you think shows the greatest promise as an inventor?   |
| (Inference)                | 4. Why do you think Wil shows the greater promise?  |
| (Synthesis)                | 5. What qualities does Mrs. Wright show which are important in developing Wil and Orv as inventors?   |
| (Inference)                | 6. What valuable knowledge did Mrs. Wright provide which helped to make the sled a success?   |
| (Analysis)                 | 7. In what ways do you think Wil and Orv changed as a result of their success with the sled.  |
| (Evaluation)               | 8. Who do you think the author presents as the most important person in the story? Explain.   |
| (Synthesis)                | 9. This story tells about only a short period of the Wright brothers' lives. Why do you think the author chose this particular period to write about? |
| (Analysis-<br>Application) | 10. Suppose you are like Orv and Wil and wanted to build a go-cart. How might you go about doing it?  |



APPENDIX T

GENERALIZATION STRATEGY AND QUESTIONING STRATEGY FOR  
THE STORY "THE LAST DAY OF SEPTEMBER"

(Story Source: Comprehension Strategies, Gage Strategies  
for Language Arts I, pp. 207-210)





Generalization Strategy for The Last Day of September

There are various effects of the decision we make.

7. \_\_\_\_\_

- |                          |  |
|--------------------------|--|
| One must form a decision | (a) remain with group & support the behavior |
|                          | (b) remain with group & not be supportive    |
|                          | (c) not to support group nor remain.         |

6. \_\_\_\_\_

Assessing the group's behavior in accordance with our beliefs becomes necessary.

5. \_\_\_\_\_

Conflicts arise when we need to be part of the group but we object to a 'group behavior.'

4. \_\_\_\_\_

Acceptance by a group involves identifying with the group in a certain way.

3. \_\_\_\_\_

This means being accepted by the group.

2. \_\_\_\_\_

We all have a need to feel part of a group.

1. \_\_\_\_\_

Theme - Group Belonging



Questioning Strategy for The Last Day of September—Key Questions

- |                  |   |
|------------------|---|
| (Fact)           | # 1. What are the names of the children you find in the beginning of the story?   |
| (Interpretation) | 2. Are they likely to be members of the same class at school? How do you know?  |
| (Analysis)       | 3. Melissa appears to be 'following' Mary Ellen. Why might she do this?   |
| (Evaluation)     | 4. Who would you consider to be more accepted by the group, Melissa or Mary Ellen? Support your answer.   |
| (Analysis)       | 5. What evidence is there that Melissa feels a need to be accepted into the group?  |
| (Synthesis)      | 6. What might have been some of Melissa's thoughts as she listened to Mary Ellen and the other children laughing and chanting: "Apple Annie! Apple Annie!"? |
| (Analysis)       | 7. What decisions did Melissa have to make?   |
| (Synthesis)      | 8. How do you think she feels about the decision she made? Why?   |
| (Inference)      | 9. Who do you think Apple Annie was?  |
| (Analysis)       | 10. Why do you think the children teased her?   |
| (Analysis)       | 11. What does Mary Ellen mean when she says "Sometimes you have to pretend you know"?   |
| (Synthesis)      | 12. Retell the events that happened as Melissa might have told them to her parents.   |
| (Synthesis)      | 13. If you had been part of the group, what might you have learnt from the experience?  |
| (Evaluation)     | 14. What do you think of the children's behavior toward Apple Annie? Why?   |
| (Analysis)       | 15. How are Melissa and Apple Annie alike?  |
| (Evaluation)     | 16. Apple Annie said to Melissa "You're like all the others." Do you agree with Apple Annie's statement? Explain why.                                       |



APPENDIX U

GENERALIZATION STRATEGY AND QUESTIONING STRATEGY FOR

STORY "LARRY CHARTS A COURSE"

(Story Source: Comprehension Strategies 2, Gage  
Strategies for Language Arts II,  
pp. 285-292)



Adapting is a continuous process through life.

10.

- Returning to routine situations—changes occur due to greater understanding of the disease and ability to adapt to necessary precautions:
- (1) participation in enjoyed activities
  - (2) healthy attitude toward the 'handicap'
  - (3) lessening of parents' concern & pressure
  - (4) lessening of ridicule from playmates
  - (5) more acceptable behavior re. child—less frustration.

9.

Through guidance and encouragement from others one learns to understand the disease, to adapt to the disease taking the necessary precautions, and to leading a normal, healthy life.

8.

- changing (1) child's feelings, attitudes & behaviors often requires: (1) expert help (2) opportunity to share experience with others who have same disease in an environment away from home.
- (2) parents' overconcern & pressures

7.

consequently there develops (1) bitter feelings (2) poor attitudes (3) outbursts of unacceptable behavior towards parents, playmates, others.

6.

Life becomes very frustrating and unhappy for the child who now sees himself as:

- (1) unable to do the things he enjoyed and continues to want to do
- (2) suddenly 'different' from his friends
- (3) teased by his playmates.

5.

To friends and playmates (onlookers) such concern is not understood and is interpreted as 'sissylike' behavior, particularly in the case of boys.

4.

Consequence—over protection. Child is (1) not allowed to participate in strenuous activities he previously enjoyed (2) constantly treated as a 'sick' child (3) always remind to 'be careful' (4) limited in activities (5) allowed to grow dependent upon others for his 'well being.'

3.

Upon discovery of the disease there is extreme worry and concern by parents—often due to lack of understanding re. the disease.

2.

Young children can be afflicted with diseases. These diseases: (1) have particular symptoms (2) may cause embarrassing and alarming reactions (3) can be treated (4) are controllable but not curable.

1.

Theme - Adapting to Handicaps in Childhood





Questioning Strategy for Larry Charts a Course—Key Questions

- |                          |      |  |
|--------------------------|------|--|
| (Fact)                   | # 1. | What disease did Larry have?   |
| (Fact)                   | 2.   | What facts about diabetes have you learned from the story?   |
| (Interpretation)         | 3.   | How did this disease become a handicap for Larry?  |
| (Interpretation)         | 4.   | How would you describe Mrs. Foster's behavior toward Larry?  |
| (Analysis)               | 5.   | How did Mrs. Foster's concern affect Larry?  |
| (Analysis)               | 6.   | How would you explain Larry's behavior toward his mother and father?   |
| (Interpretation)         | 7.   | Why does Larry at first refuse to go to camp?  |
| (Interpretation)         | 8.   | What made Larry change his attitude toward the camp?   |
| (Analysis)               | 9.   | What explanation can you give for Larry's change of attitude and behavior after the Skit performance?  |
| (Evaluation)             | 10.  | What do you think of his behavior?   |
| (Analysis)               | 11.  | In what ways would you consider the summer camp a worthwhile experience for (a) Larry? (b) for his parents?  |
| (Evaluation)             | 12.  | What argument can you give for the statement "Larry would have learned to lead a normal, healthy life without going to camp"?  |
| (Analysis)               | 13.  | Why might Larry be likely to have less frustrations after he returns home from camp?   |
| (Analysis)               | 14.  | From this story what would you say are some very important factors that affect how well one adjusts to a handicap?   |
| (Evaluation)             | 15.  | Do you think that organized groups such as Diabetic Summer Camps, Crippled Children's Camps etc. are valuable? Explain why?  |
| (Analysis & Application) | 16.  | Nancy who is 12 years old was recently in a car accident. Her legs were badly injured and one had to be taken off at the knee. How will her experience in adjusting to her handicap be |



similar to Larry's? How will it be different?

(Synthesis &  
Application)

17. You are a group of normal healthy fifth graders. Imagine that you are asked to help handicapped children in your classroom adjust to their handicaps. What points from the story could you set down as a guide to help you?



APPENDIX V

GENERALIZATION STRATEGY AND QUESTIONING STRATEGY FOR

THE STORY "GULLIVER THE GREAT"

(Story Source: Bright Peaks, Mifflin Readers, pp. 277-286)





1. Certain fears have been due to misunderstanding of the 'object' feared.
2. Gaining an understanding of the object, such as an animal, establishes a new relationship e.g. trust.
3. He exists in relationship to others. Isolation destroys this companionship; increases his need to communicate; and makes aspects of life insignificant.

During long period of loneliness the individual may discover various aspects about himself and life.

5.

Persistence and continued effort toward survival is necessary, in spite of

-fear < -of the actual disaster or  
-arising from the disaster  
-despair -from disappointment.

4.

1. ability to remain calm
2. the resources available

Survival will depend upon several factors:

3. ability to recall necessary knowledge
4. ingenuity of the individual
5. ability to conquer despair
6. facility in a needed skill such as swimming.

3.

Immediate reactions to the crisis may vary	-panic	All action	-using all his resources
	-fear	is directed	-attempting to overcome/defeat fears.
	-calmness	toward survival	

2.

Disasters are generally unpredictable. Warnings      physical signs      may go unnoticed.  
- apprehensive feelings

1.

Theme - Surviving a Crisis or Disaster



The experience is one which, because it is meaningful to the individual in a special way, he wishes to share with others by writing about it.

7.

---

-is dependent upon others

-restores a relationship with others

-is a result of his endurance & ingenuity

-allows him to give up efforts toward survival.

Rescue - the ultimate of his needs

6.



Questioning Strategy for Gulliver the Great—Key Questions

- (Interpretation) 1. Who is the story about?
- (Recall) 2. What frightening experiences did Mr. Dyer have?
- (Interpretation) 3. What information about the ship might have warned Mr. Dyer, the storyteller, of possible disaster?
- (Interpretation) 4. Why did he still decide to go on the ship?
- (Analysis) 5. In what ways does Mr. Dyer show clear thinking at the time of the disaster?
- (Evaluation) 6. Which of the two situations did the storyteller fear the most: (1) having the dog on the same raft with him, or (2) the danger of floating alone on a raft in the Pacific Ocean for several days? Explain.
- (Analysis) 7. What things helped the storyteller overcome his fear of the dog, Gulliver?
- (Analysis) 8. Often we fear something because we do not understand it. Can you find examples of this in the story?
- (Analysis) 9. Man cannot live totally alone but needs the companionship of others. How is this shown in the story?
- (Analysis) 10. What things in Mr. Dyer's normal daily life were meaningless during the five days that he was floating on a raft in the Pacific Ocean?
- (Analysis) 11. What qualities did Mr. Dyer have which made it possible for him to survive the ordeal?
- (Evaluation) 12. What would you consider to be the most important moment for the writer during the whole adventure?
- (Evaluation) 13. After Mr. Dyer was found he fell into a state of complete exhaustion. What might have happened if he had not been found for another several hours?
- (Application-Evaluation) 14. Suppose Mr. Dyer was lost in a remote area of Northern Canada for several days. Do you think this would be an easier or more difficult experience for him than the experience you just read about?



(Analysis-  
Synthesis)

15. From what you have learned by Mr. Dyer's experience, how might you best survive a disaster?





APPENDIX W

GENERALIZATION STRATEGY AND QUESTIONING STRATEGY FOR

THE STORY "THE HUNDRED DRESSES"

(Story Source: Silver Webb, Reading Caravans, pp. 44-59)



## Generalization Strategy for The Hundred Dresses

- an individual who is 'leader' within a group (not supported by entire group)
- the whole group
- the authority figure in the group
- others

Ridicule may come from

6.

Non-acceptance in the form of ridicule results in isolation for the individual and a need to build up some form of 'defense.'

- exaggeration
- lying
- others

e.g.

5.

The individual becomes more comfortable if accepted - pleasant relationships develop.

- polite interest but ridicule
- outright ridicule
- teasing - unintentional 'harm'
- etc.

Non acceptance may be subtle and take many forms

4.

This uncomfortable feeling generally relates to non-acceptance and a feeling of being different.

3.

The individual is often uncomfortable about this particular feature.

2.

- |  |   |   |
|--|---|---|
| Certain features of an individual<br>may make them 'stand-out' from others | -appearance<br>-name<br>-language<br>-living area | -size<br>-clothing<br>-looks<br>-physical feature, etc. |
|--|---|---|

1.

Theme - Relationships with Others



Generalization Strategy for The Hundred Dresses (continued)

An acceptable solution is reached.

11.

Correcting the situation may not be easy nor able to be settled as one might wish.

10.

1. make a friendly gesture without mentioning the real issue
- 1a. feel guilty but fear admitting it because of non acceptance of them
- 1b. openly admit the error
2. compare their behavior with others so it does not appear so harmful
3. assume the ridiculed person was 'less sensitive' to such situations
4. assume the ridiculed person is less intelligent and therefore not aware of what actually was happening
5. consider it was only 'fun' anyway
6. accept they were at fault and apologize
7. others.

When correction move is begun those at fault may respond in several ways:

9.

Revelation of facts leads to someone taking responsibility for correcting the situation

- person in authority e.g. teacher
- a sympathizer who identifies with the situation
- others

8.

Unchecked ridicule can lead to unexpected happenings.

7.





Questioning Strategy for The Hundred Dresses—Key Questions

- |                  |   |
|------------------|---|
| (Fact)           | 1a. Who was Wanda?  |
| (Fact)           | 1b. What does the story tell us about Wanda?  |
| (Fact)           | 2. How did the children treat her?  |
| (Fact)           | 3. How did Peggy tease Wanda?   |
| (Interpretation) | 4. Why do you think Wanda always gave the answers she did?  |
| (Interpretation) | 5. Why did Maddie not take part in the actual teasing?  |
| (Synthesis)      | 6. What might Wanda have been thinking about as she walked home from school each day?   |
| (Analysis)       | 7. How does the author make you feel that Wanda is not accepted by the class?   |
| (Analysis)       | 8. Think about the teachers statement on p. 52:<br>"I am sure that none of the boys and girls in Room Thirteen would purposely and deliberately hurt anyone's feelings . . . I prefer to think that what was said was said in thoughtlessness."<br>Do you see the children's behavior toward Wanda as the teacher sees it? Explain. |
| (Analysis)       | 9. Maddie considered herself more at fault than Peggie. What were her reasons for thinking this?  |
| (Evaluation)     | 10. Do you agree with Maddie that she is more guilty than Peggie?   |
| (Analysis)       | 11. How is Maddie like Melissa in the story "The Last Day of September"?  |
| (Analysis)       | 12. How does Peggie try to make her actions appear as being 'not all bad'?  |
| (Analysis)       | 13. What differences do you see in the two girls by their reactions to the whole situation?   |
| (Synthesis)      | 14. Suppose Maddie had spoken her feelings to Wanda and Peggie. What might have been the result?<br>(Support your answer.)  |
| (Fact)           | 15. What does the author tell us about Peggy?   |



- (Analysis) 16. Why is Peggy's friendship important to Maddie?
- (Analysis) 17. In what ways is Wanda's and Peggy's friendship not a good friendship?
- (Analysis) 18. Why do you think Maddie's and Peggy's letter to Wanda was a friendly one and did not say they were sorry for their behavior?
- (Evaluation) 19. Was Wanda's letter to the class as satisfying for Peggy and Maddie as if they had received a letter from Wanda? Why?
- (Analysis) 20. Explain why it was possible for feelings of isolation and loneliness to develop in students such as Wanda at this particular school?
- (Application) 21. When such problems as this occur within your school, what are some things that can be done to lessen the problem?
- (Evaluation) 22. Can you judge from the ending of the story that Wanda does or does not feel resentment toward the girls or the school? Support your answer.
- (Evaluation) 23. Who do you consider to be the most at fault in this story? Explain.
- (Synthesis) 24. What do you think the writer wanted us to learn from the experience you just read about in this story?



APPENDIX X

GENERALIZATION STRATEGY AND QUESTIONING STRATEGY FOR  
THE STORY "THE REAL UGLY DUCKLING"

(Story Source: The Sun That Warms You, Ginn Reading  
360, pp. 148-160)



Generalization Strategy for the Story The Real Ugly Duckling

When success is achieved, all the difficulties encountered become unimportant. The focus becomes that of satisfaction in one's accomplishment and the recognition gained from that accomplishment.

5. \_\_\_\_\_

- |   |  |
|---|--|
| In addition to determination and self criticism, other factors are necessary for success and fame | -opportunities to meet important people in your field and receive direction from them<br>-the honesty of their evaluation of your talent<br>-opportunities for advancing |
|---|--|

4. \_\_\_\_\_

Facing these difficulties requires determination and self criticism

-recognizing the talent you have  
-recognizing the talent you don't have  
-redirecting interests.

3. \_\_\_\_\_

Achieving success is not always easy. It may be very difficult

-failure  
-humility  
-suffering, etc.

2. \_\_\_\_\_

Childhood interests may lead to success and fame.

1. \_\_\_\_\_

Theme - Becoming Successful and Famous





Questioning Strategy for The Real Ugly Duckling—Key Questions

- |                  |  |
|------------------|--|
| (Fact)           | # 1. What was Hans greatest ambition?  |
| (Interpretation) | 2. What things in his early life made him decide to become an actor?   |
| (Fact)           | 3. Why did he not achieve this goal?   |
| (Fact)           | 4. What other things had Hans tried to become?   |
| (Analysis)       | 5. When Hans left home he told his mother, "First you suffer a great deal, then you become famous." How does this statement describe Hans' own life? |
| (Analysis)       | 6. What particular qualities did Hans have which helped him to finally succeed?  |
| (Interpretation) | 7. How did each important person Hans met contribute to his success?   |
| (Analysis)       | 8. Why do you think Hans was finally able to succeed in what he wanted to do?  |
| (Synthesis)      | 9. Do you think Hans would have been able to write his fairy tales if he hadn't returned to school? Explain.   |
| (Synthesis)      | 10. What argument can you give for or against the statement: "Hans may have become successful if he had remained at home"?                           |
| (Synthesis)      | 11. Imagine that Hans was a boy growing up in Alberta today. How might the story of his life be different?   |
| (Analysis)       | 12. How is the achieving of success for school children a similar experience to Hans Christian Anderson's?   |
| (Analysis)       | 13. In what ways might the experience be different?  |
| (Application)    | 14. What point might the author be trying to show you through this story about your own future success?  |
| (Evaluation)     | 15. Is success always related to fame and renown such as you found in this story of Hans Christian Anderson?   |

















**B30156**